

Access DB# 121586**SEARCH REQUEST FORM**

Scientific and Technical Information Center

Requester's Full Name: DR. N. Z. D. W. C. Examiner #: 69332 Date: 5/7/64  
Art Unit: 711 Phone Number 302-681 Serial Number: 10/616588  
Mail Box and Bldg/Room Location: 6071 Results Format Preferred (circle): PAPER DISK E-MAIL

**If more than one search is submitted, please prioritize searches in order of need.**

\*\*\*\*\*

Please provide a detailed statement of the search topic, and describe as specifically as possible the subject matter to be searched. Include the elected species or structures, keywords, synonyms, acronyms, and registry numbers, and combine with the concept or utility of the invention. Define any terms that may have a special meaning. Give examples or relevant citations, authors, etc, if known. Please attach a copy of the cover sheet, pertinent claims, and abstract.

Title of Invention: \_\_\_\_\_

Inventors (please provide full names): \_\_\_\_\_

Earliest Priority Filing Date: \_\_\_\_\_

*\*For Sequence Searches Only\* Please include all pertinent information (parent, child, divisional, or issued patent numbers) along with the appropriate serial number.*

*Formula of claim 1. Charles*

\*\*\*\*\*

**STAFF USE ONLY**

	Type of Search	Vendors and cost where applicable
Searcher: _____	NA Sequence (#) _____	STN _____
Searcher Phone #: _____	AA Sequence (#) _____	Dialog _____
Searcher Location: _____	Structure (#) _____	Questel/Orbit _____
Date Searcher Picked Up: _____	Bibliographic _____	Dr. Link _____
Date Completed: _____	Litigation _____	Lexis/Nexis _____
Searcher Prep & Review Time: _____	Fulltext _____	Sequence Systems _____
Clerical Prep Time: _____	Patent Family _____	WWW/Internet _____
Online Time: _____	Other _____	Other (specify) _____



# STIC Search Report

## EIC 1700

STIC Database Tracking Number: 121586

TO: Duc Truong

Location: 10071

Art Unit : 1711

May 13, 2004

Case Serial Number: 10/616168

From: Barba Koroma

Location: EIC 1700

REM EO4 A30

Phone: 571 272 2546

barba.koroma@uspto.gov

### Search Notes

Examiner Truong,

Please find attached results of the search you requested. Various components of the claimed invention as spelt out in the claims were searched in REGISTRY and CAPLUS databases.

For your convenience, titles of hits have been listed to help you peruse the results set quickly. This is followed by a detailed printout of records. Please let me know if you have any questions.

Thanks.



# STIC Search Results Feedback Form

**EIC17000**

Questions about the scope or the results of the search? Contact *the EIC searcher or contact:*

Kathleen Fuller, EIC 1700 Team Leader  
571/272-2505 REMSEN 4B28

## Voluntary Results Feedback Form

- I am an examiner in Workgroup:  Example: 1713  
➤ Relevant prior art **found**, search results used as follows:

- ☐ 102 rejection
- ☐ 103 rejection
- ☐ Cited as being of interest.
- ☐ Helped examiner better understand the invention.
- ☐ Helped examiner better understand the state of the art in their technology.

*Types of relevant prior art found:*

- ☐ Foreign Patent(s)
- ☐ Non-Patent Literature  
(journal articles, conference proceedings, new product announcements etc.)

➤ Relevant prior art **not found**:

- ☐ Results verified the lack of relevant prior art (helped determine patentability).
- ☐ Results were not useful in determining patentability or understanding the invention.

Comments:

Drop off or send completed forms to EIC1700 REMSEN 4B28



=> file reg

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.44	550.43
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Property values tagged with IC are from the ZIC/VINITI data file  
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STRUCTURE FILE UPDATES: 12 MAY 2004 HIGHEST RN 681425-81-0  
DICTIONARY FILE UPDATES: 12 MAY 2004 HIGHEST RN 681425-81-0

TSCA INFORMATION NOW CURRENT THROUGH JANUARY 6, 2004

Please note that search-term pricing does apply when  
conducting SmartSELECT searches.

Crossover limits have been increased. See HELP CROSSOVER for details.

Experimental and calculated property data are now available. For more  
information enter HELP PROP at an arrow prompt in the file or refer  
to the file summary sheet on the web at:  
<http://www.cas.org/ONLINE/DBSS/registryss.html>

=> file caplus

COST IN U.S. DOLLARS	SINCE FILE ENTRY	TOTAL SESSION
FULL ESTIMATED COST	0.42	550.85
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CA SUBSCRIBER PRICE	0.00	-0.69

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FILE COVERS 1907 - 13 May 2004 VOL 140 ISS 20  
FILE LAST UPDATED: 12 May 2004 (20040512/ED)

This file contains CAS Registry Numbers for easy and accurate substance identification.

=> d que

L17

STR



#### NODE ATTRIBUTES:

NSPEC	IS	R	AT	1
NSPEC	IS	R	AT	2
NSPEC	IS	R	AT	3
NSPEC	IS	R	AT	7
NSPEC	IS	R	AT	8
NSPEC	IS	R	AT	10
CONNECT	IS	E2	R	AT 3
CONNECT	IS	E2	R	AT 10
DEFAULT MLEVEL IS ATOM				
DEFAULT ECLEVEL IS LIMITED				

#### GRAPH ATTRIBUTES:

RING(S) ARE ISOLATED OR EMBEDDED  
NUMBER OF NODES IS 8

#### STEREO ATTRIBUTES: NONE

L18	SCR	2043
L20	31103	SEA FILE=REGISTRY SSS FUL L17 AND L18
L21	29018	SEA FILE=CAPLUS ABB=ON PLU=ON L20
L22	119	SEA FILE=CAPLUS ABB=ON PLU=ON L21 AND CYCLIC (3A) ESTER
L23	104	SEA FILE=CAPLUS ABB=ON PLU=ON L22 AND POLYMERIZ?
L24	100	SEA FILE=CAPLUS ABB=ON PLU=ON L23 AND PREP/RL
L26	64	SEA FILE=CAPLUS ABB=ON PLU=ON L24 AND ESTER? (4A) ?POLYMERIZATI
		ON?
L28	1	SEA FILE=CAPLUS ABB=ON PLU=ON 2004:60578/AN
L30	64	SEA FILE=CAPLUS ABB=ON PLU=ON L26 OR L28
L31	12120	SEA FILE=CAPLUS ABB=ON PLU=ON L21 (L) (IMF OR PREP OR SPN) /RL
L32	61	SEA FILE=CAPLUS ABB=ON PLU=ON L30 AND L31

=> d ti 1-61

- L32 ANSWER 1 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI High-molecular-weight aliphatic polyesters and process for producing them
- L32 ANSWER 2 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Bis(amido)titanium complexes having chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening polymerization of cyclic esters
- L32 ANSWER 3 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Process for copolymerization of cyclic ester oligomers
- L32 ANSWER 4 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Living polymerization of cyclic esters - a route to (bio)degradable polymers. Influence of chain transfer to polymer on livingness
- L32 ANSWER 5 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Aliphatic polyester and manufacture of the polyester in melt extrusion
- L32 ANSWER 6 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Strontium-based initiator system for ring-opening polymerization of cyclic esters
- L32 ANSWER 7 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Ring-opening polymerization of aliphatic cyclic esters by using organic amino calcium catalyst
- L32 ANSWER 8 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Biodegradable Polymersomes
- L32 ANSWER 9 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Polyhydroxycarboxylic acid and its production process
- L32 ANSWER 10 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Ring opening polymerisations of cyclic esters and carbonate by rare-earth LnCp3
- L32 ANSWER 11 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Use of zinc derivatives as cyclic ester polymerization catalysts
- L32 ANSWER 12 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Soluble tin(II) macroinitiator adducts for the controlled ring-opening polymerization of lactones and cyclic carbonates
- L32 ANSWER 13 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Method for preparing polyesters having intrachain free acid functions
- L32 ANSWER 14 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

- TI Kinetics and mechanism of **cyclic esters polymerization** initiated with covalent metal carboxylates, 5a end-group studies in the model  $\epsilon$ -caprolactone and L,L-dilactide/tin(II) and zinc octoate/butyl alcohol systems
- L32 ANSWER 15 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI **Polymerizations of Cyclic Esters** Catalyzed by Titanium Complexes Having Chalcogen-Bridged Chelating Diaryloxo Ligands
- L32 ANSWER 16 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Synthesis of aliphatic polyesters of various architectures by the controlled ring-opening **polymerization of cyclic esters**
- L32 ANSWER 17 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Control of Mn, Mw/Mn, end-groups, and kinetics in living **polymerization of cyclic esters**
- L32 ANSWER 18 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Method for preparation of biodegradable aliphatic polyesters by using calcium organic compounds as ring opening **polymerization** catalysts
- L32 ANSWER 19 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Ring opening **polymerization** of lactides using nucleophilic organic catalysts
- L32 ANSWER 20 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Mechanistic Comparison of **Cyclic Ester Polymerizations** by Novel Iron(III)-Alkoxide Complexes: Single vs Multiple Site Catalysis
- L32 ANSWER 21 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI First Example of N-Heterocyclic Carbenes as Catalysts for Living **Polymerization: Organocatalytic Ring-Opening Polymerization of Cyclic Esters**
- L32 ANSWER 22 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Polymers based on heterocyclic monomers, their production and use of stannylenes and germylenes as catalysts therefor
- L32 ANSWER 23 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI **Polymerization of lactide and related cyclic esters** by discrete metal complexes
- L32 ANSWER 24 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI Process for the preparation of polymers of dimeric **cyclic esters**
- L32 ANSWER 25 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN
- TI A Novel and Versatile Calcium-Based Initiator System for the Ring-Opening **Polymerization of Cyclic Esters**

- L32 ANSWER 26 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI **Polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide
- L32 ANSWER 27 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Lactide **polymerization** activity of alkoxide, phenoxide, and amide derivatives of yttrium(III) arylamidinates
- L32 ANSWER 28 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI **Polymerizations** of  $\epsilon$ -caprolactone and L,L-dilactide initiated with stannous octoate and stannous butoxide - a comparison
- L32 ANSWER 29 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Controlled ring-opening **polymerization** of L-lactide and 1,5-Dioxepan-2-one forming a triblock copolymer
- L32 ANSWER 30 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Copolymers of  $\epsilon$ -caprolactone and **cyclic esters** of alpha-hydroxyacids and polyurethanes derivable from these polymers
- L32 ANSWER 31 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Synthesis of aliphatic polyesters by controlled ring-opening **polymerization of cyclic esters**.  
Characterization, properties, transesterification reactions
- L32 ANSWER 32 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Latexes and microspheres by ring-opening **polymerization**.  
**Polymerization of cyclic esters**
- L32 ANSWER 33 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Controlled **polymerization of cyclic esters**.  
Covalent metal alkoxides vs. carboxylates:  $\text{Sn}(\text{OC}_4\text{H}_9)_2$  vs.  $\text{Sn}(\text{OC}(\text{O})\text{C}_7\text{H}_{15})$  (viz  $\text{Sn}(\text{Oct})_2$ )
- L32 ANSWER 34 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Titanate-catalyzed ring-opening **polymerization** of **cyclic phthalate ester** oligomers
- L32 ANSWER 35 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Metal complexes with a tridentate ligand, their preparation and use as **polymerization** catalysts
- L32 ANSWER 36 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Direct synthesis of polyester microspheres, potential carriers of bioactive compounds
- L32 ANSWER 37 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Polycarbonate copolyester diols their preparation and use
- L32 ANSWER 38 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Method for preparation of aliphatic polyesters

- L32 ANSWER 39 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Stereochemical aspects of the controlled ring-opening  
**polymerization** of chiral **cyclic esters**
- L32 ANSWER 40 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI A novel rare earth coordination catalyst for **polymerization** of  
biodegradable aliphatic lactones and lactides
- L32 ANSWER 41 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Preparation of Group IIIA complexes containing one mono- or di-anionic  
tridentate ligand and their use as **polymerization** catalysts
- L32 ANSWER 42 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI **Cyclic ester** preparation and purification by aqueous  
solvent extraction for preparation of high molecular weight polymers
- L32 ANSWER 43 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Method to produce and purify **cyclic esters**
- L32 ANSWER 44 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI New initiators for the ring-opening **polymerization** of  
**cyclic esters**
- L32 ANSWER 45 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Bioabsorptive polyester and its production method
- L32 ANSWER 46 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Manufacture of microspheres and latexes of polyesters of low particle-size  
dispersity
- L32 ANSWER 47 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Synthesis of degradable crosslinked polymers based on 1,5-dioxepan-2-one  
and crosslinker of bis- $\epsilon$ -caprolactone type
- L32 ANSWER 48 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI New type of crosslinking agents for vinyl polymers
- L32 ANSWER 49 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Macromolecular engineering of polylactones and polylactides by  
ring-opening **polymerization**
- L32 ANSWER 50 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Method to produce and purify **cyclic esters**
- L32 ANSWER 51 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Manufacture and purification of **cyclic esters**
- L32 ANSWER 52 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Evidence for **Ester-Exchange** Reactions and **Cyclic**  
Oligomers Formation in the Ring-Opening **Polymerization** of  
Lactide with Aluminum Complex Initiators

L32 ANSWER 53 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Copolymerization of 2,2-dimethyltrimethylene carbonate and **cyclic esters**

L32 ANSWER 54 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Manufacture of biodegradable polyesters

L32 ANSWER 55 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids

L32 ANSWER 56 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Preparation of polyester of controlled molecular weight based on the determination of free acid impurities in monomer

L32 ANSWER 57 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Biodegradable polymers. 7th Comm. On the mechanism of ring-opening **polymerization of cyclic esters** of aliphatic hydroxycarboxylic acids by means of different tin compounds

L32 ANSWER 58 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Poly(L-lactide) crosslinked with spiro-bis-dimethylenecarbonate

L32 ANSWER 59 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Process and catalyst for the **polymerization of cyclic esters**

L32 ANSWER 60 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Manufacture of biologically degradable (co)polyesters having controlled molecular weights

L32 ANSWER 61 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
TI Polyimides prepared from carbamic acids

=> d ibib abs hitstr ind total

L32 ANSWER 1 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2004:333766 CAPLUS  
DOCUMENT NUMBER: 140:304686  
TITLE: High-molecular-weight aliphatic polyesters and process for producing them  
INVENTOR(S): Yamane, Kazuyuki; Kato, Ryo; Ono, Toshihiko  
PATENT ASSIGNEE(S): Kureha Chemical Industry Company, Limited, Japan  
SOURCE: PCT Int. Appl., 21 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: Japanese  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2004033528	A1	20040422	WO 2003-JP12882	20031008

W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD

RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: JP 2002-295276 A 20021008

AB The process comprises subjecting a (co)polymer produced by ring-opening (co)polymerization of  $\geq 1$  cyclic ester selected from the group consisting of glycolide and lactides to a chain extension reaction with an oxazoline compound [e.g., 2,2'-m-phenylene bis(2-oxazoline)] to increase the mol. weight of the (co)polymer. The mol. weight of the polymers has been increased to such a degree that the mol. weight increase ratio represented by the ratio (Mw2/Mw1) of the weight-average mol.

weight of the (co)polymer after the chain extension (Mw2) to that of the (co)polymer before the chain extension (Mw1) is  $\geq 1.10$ .

IT 677005-82-2P, Glycolide-2,2'-m-phenylene bis(2-oxazoline) copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(preparation of high-mol.-weight aliphatic polyesters by using oxazoline chain extenders)

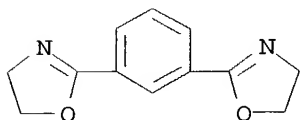
RN 677005-82-2 CAPLUS

CN 1,4-Dioxane-2,5-dione, polymer with 2,2'-(1,3-phenylene)bis[4,5-dihydrooxazole] (9CI) (CA INDEX NAME)

CM 1

CRN 34052-90-9

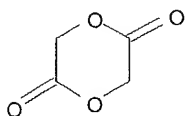
CMF C12 H12 N2 O2



CM 2

CRN 502-97-6

CMF C4 H4 O4



IC ICM C08G063-91  
 CC 37-3 (Plastics Manufacture and Processing)  
 ST oxazoline chain extender **cyclic ester** polymer;  
 glycolide polymer oxazoline chain extender; lactide polymer oxazoline  
 chain extender  
 IT Polyesters, preparation  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
 (aliphatic; preparation of high-mol.-weight aliphatic polyesters by using  
 oxazoline  
 chain extenders)  
 IT 677005-82-2P, Glycolide-2,2'-m-phenylene bis(2-oxazoline)  
 copolymer  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
 (preparation of high-mol.-weight aliphatic polyesters by using oxazoline  
 chain  
 extenders)

REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 2 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2004:99423 CAPLUS

DOCUMENT NUMBER: 140:321797

TITLE: Bis(amido)titanium complexes having chelating  
 diaryloxo ligands bridged by sulfur or methylene and  
 their catalytic behaviors for ring-opening  
**polymerization of cyclic  
 esters**

AUTHOR(S): Takashima, Yoshinori; Nakayama, Yuushou; Hirao,  
 Toshikazu; Yasuda, Hajime; Harada, Akira

CORPORATE SOURCE: Graduate School of Engineering, Department of  
 Materials Chemistry, Osaka University, Suita, Osaka,  
 565-0871, Japan

SOURCE: Journal of Organometallic Chemistry (2004), 689(3),  
 612-619

CODEN: JORCAI; ISSN: 0022-328X

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A series of bis(dialkylamido) titanium complexes coordinated by O-E-O  
 (E=S, CH<sub>2</sub>) chelating bis(aryloxo) ligands, Ti[E(4-Me-6-tBuC<sub>6</sub>H<sub>2</sub>O)<sub>2</sub>](NR<sub>2</sub>)<sub>2</sub>  
 (1: E=S, R = Me; 2: E = S, R = Et; 3: E = CH<sub>2</sub>, R = Me; 4: E = CH<sub>2</sub>, R =  
 Et), were synthesized by the reaction of Ti(NR<sub>2</sub>)<sub>4</sub> (R=Me, Et) with  
 2,2'-E(4-Me-6-tBuC<sub>6</sub>H<sub>2</sub>OH)<sub>2</sub> (E = S, CH<sub>2</sub>). The crystal structures of  
 complexes 2 and 4 were determined by x-ray diffraction study. Complex 2 has a



trigonal bipyramidal structure with the sulfur and nitrogen atom in trans positions and complex 4 has a tetrahedral structure. The complex 2 initiated the controlled **polymerization** of  $\epsilon$ -caprolactone (I) in toluene at 100°C affording poly-I and poly(L-lactide) with relatively narrow mol. weight distributions. The complex 4 showed higher activity for the **polymerization** of I to give a polymer with a broader mol. weight distribution in comparison with complex 2.

IT 33135-50-1P, Poly(L-lactide)

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)

RN 33135-50-1 CAPLUS

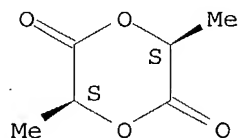
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 75, 78

ST caprolactone lactide ring opening **polymn** catalyst

bisamidotitanium complex diaryloxo

IT Molecular weight

Molecular weight distribution

(bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)

IT Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)

IT Crystal structure

Molecular structure

(of bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene for ring-opening **polymerization** of lactide and caprolactone)

IT **Polymerization** catalysts

- (ring-opening; preparation and properties of bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene for ring-opening **polymerization** of lactide and caprolactone)
- IT 678986-05-5P 678986-06-6P  
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)  
(bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)
- IT 25248-42-4P, Poly(.vepsiln.-caprolactone), sru 26161-42-2P, Poly(L-lactide), sru 33135-50-1P, Poly(L-lactide)  
RL: PRP (Properties); **SPN (Synthetic preparation)**; **PREP (Preparation)**  
(bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)
- IT 90-66-4 119-47-1 3275-24-9 4419-47-0  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)
- IT 444609-23-8P 678986-07-7P  
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)  
(crystal structure; bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene and their catalytic behaviors for ring-opening **polymerization** of lactide and caprolactone)
- IT 24980-41-4P, Poly(.vepsiln.-caprolactone)  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**  
(preparation and properties of bis(amido)titanium complexes with chelating diaryloxo ligands bridged by sulfur or methylene for ring-opening **polymerization** of lactide and caprolactone)

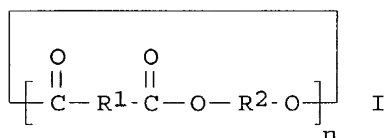
REFERENCE COUNT: 59 THERE ARE 59 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 3 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2004:60578 CAPLUS  
DOCUMENT NUMBER: 140:112165  
TITLE: Process for **copolymerization** of **cyclic ester** oligomers  
INVENTOR(S): Brugel, Edward G.  
PATENT ASSIGNEE(S): E. I. Du Pont De Nemours and Company, USA  
SOURCE: PCT Int. Appl., 20 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

*Applicant*

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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 WO 2004007589      A1      20040122      WO 2003-US21742      20030711  
 W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,  
 CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,  
 GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,  
 LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM,  
 PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,  
 TR, TT, TZ, UA, UG, UZ, VC, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG,  
 KZ, MD, RU, TJ  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG,  
 CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC,  
 NL, PT, RO, SE, SI, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
 GW, ML, MR, NE, SN, TD, TG  
 US 2004054124      A1      20040318      US 2003-616168      20030709  
 PRIORITY APPLN. INFO.:      US 2002-395557P      P      20020712  
 GI



AB The process comprises contacting under ring opening **polymerization** condition a mixture of  $\geq 2$  **melted** chemical different **cyclic ester** oligomers I (R1, R2 = (un)substituted hydrocarbylene; n  $\geq 1$ ), such as terephthalic acid-diethylene glycol **cyclic ester** dimer and a mixture of terephthalic acid-1,4-butanediol **cyclic ester** dimer and trimer, in the presence of a catalyst (e.g., butyltin chloride dihydroxide) to form a copolyester. The copolyesters formed are especially useful as encapsulants and coatings. In many instances the copolyesters, assuming they are not randomized in later transesterification reactions, have unique microstructures related to the sequencing of repeat units the their polymer chains.

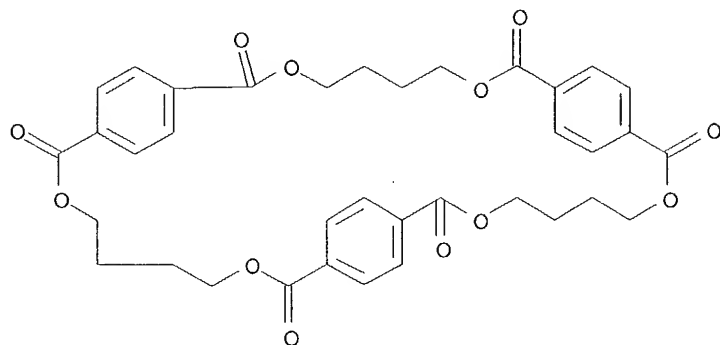
IT 646063-99-2P  
 RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); PREP (Preparation); USES (Uses)  
 (process for copolymn. of cyclic ester oligomers)

RN 646063-99-2 CAPLUS

CN 3,8,15,20,27,32-Hexaoxatetracyclo[32.2.2.210,13.222,25]dotetraconta-10,12,22,24,34,36,37,39,41-nonaene-2,9,14,21,26,33-hexone, polymer with 3,6,9,16,19,22-hexaoxatricyclo[22.2.2.211,14]triaconta-11,13,24,26,27,29-hexaene-2,10,15,23-tetrone and 3,8,15,20-tetraoxatricyclo[20.2.2.210,13]octacos-10,12,22,24,25,27-hexaene-2,9,14,21-tetrone (9CI) (CA INDEX NAME)

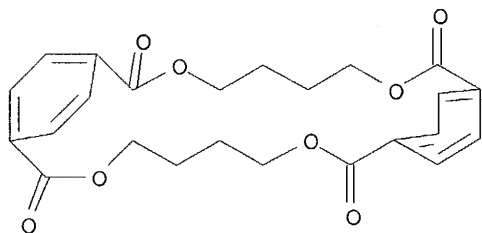
CM 1

CRN 63440-94-8  
CMF C36 H36 O12



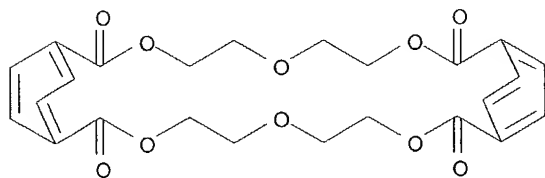
CM 2

CRN 63440-93-7  
CMF C24 H24 O8



CM 3

CRN 16104-98-6  
CMF C24 H24 O10



IC ICM C08G063-16  
ICS C08G063-78; C09D167-02  
CC 37-3 (Plastics Manufacture and Processing)

Section cross-reference(s): 38, 42

ST **cyclic ester oligomer copolymn**; terephthalic acid **cyclic ester oligomer copolymn**

IT Polyesters, preparation  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); **PREP (Preparation)**; **USES (Uses)**  
(process for **copolymn. of cyclic ester oligomers**)

IT **Polymerization**  
**Polymerization catalysts**  
(ring-opening; process for **copolymn. of cyclic ester oligomers**)

IT 13355-96-9  
RL: CAT (Catalyst use); **USES (Uses)**  
(process for **copolymn. of cyclic ester oligomers**)

IT **646063-99-2P**  
RL: IMF (Industrial manufacture); TEM (Technical or engineered material use); **PREP (Preparation)**; **USES (Uses)**  
(process for **copolymn. of cyclic ester oligomers**)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 4 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:911808 CAPLUS

DOCUMENT NUMBER: 140:94420

TITLE: **Living polymerization of cyclic esters - a route to (bio)degradable polymers.**  
Influence of chain transfer to polymer on livingness

AUTHOR(S): Penczek, Stanislaw; Szymanski, Ryszard; Duda, Andrzej; Baran, Jolanta

CORPORATE SOURCE: Centre of Molecular and Macromolecular Studies, Polish Academy of Sciences, Sienkiewicza, 90-363, Pol.

SOURCE: Macromolecular Symposia (2003), 201(Mission and Challenge of Polymer Science and Technology), 261-269  
CODEN: MSYMEC; ISSN: 1022-1360

PUBLISHER: Wiley-VCH Verlag GmbH & Co. KGaA

DOCUMENT TYPE: Journal

LANGUAGE: English

AB **Polymerization of cyclic esters** leads to (bio)degradable polymers of the increasing industrial importance. These **polymns.** are of the living nature, although chain transfer to polymer with chain scission may cause deviations from the livingness and introduce structural differences (e.g. in end-groups), important for phys. properties. Two different systems are discussed. In the first one two living macromols. react one with another and reproduce two living micromols., retaining the same reactivities and the same end-groups. **Polymns.** of  $\epsilon$ -caprolactone and lactide belong to this category. On the other hand, **polymerization** of cyclic carbonates proceeds with chain transfer, in which disproportionation of the living chains takes place: from two living macromols. one "dead" and one "doubly

active" can be formed. Conditions of retaining the livingness in terms of the ratios of the rate consts. of transfer, reinitiation, and propagation are discussed.

IT 33135-50-1P, L,L-Dilactide homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(living polymerization of cyclic esters - a route to (bio)degradable polymers. influence of chain transfer to polymer on livingness)

RN 33135-50-1 CAPLUS

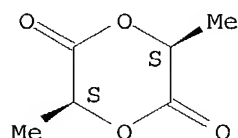
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-7 (Chemistry of Synthetic High Polymers)

ST cyclic monomer ring opening polymn living chain transfer

IT Chain transfer

Disproportionation

(living polymerization of cyclic esters - a route to (bio)degradable polymers. influence of chain transfer to polymer on livingness)

IT Polycarbonates, preparation

Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(living polymerization of cyclic esters - a route to (bio)degradable polymers. influence of chain transfer to polymer on livingness)

IT Polymerization

(living, ring-opening; living polymerization of cyclic esters - a route to (bio)degradable polymers. influence of chain transfer to polymer on livingness)

IT 24980-41-4P, ε-Caprolactone homopolymer 25248-42-4P, Poly[oxy(1-oxo-1,6-hexanediyl)] 31852-84-3P, Trimethylene carbonate homopolymer 33135-50-1P, L,L-Dilactide homopolymer 50862-75-4P, Poly(oxycarbonyloxy-1,3-propanediyl)

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(living polymerization of cyclic esters - a

route to (bio)degradable polymers. influence of chain transfer to polymer on livingness)

REFERENCE COUNT: 13 THERE ARE 13 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 5 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:710849 CAPLUS

DOCUMENT NUMBER: 139:215437

TITLE: Aliphatic polyester and manufacture of the polyester in melt extrusion

INVENTOR(S): Miura, Hiromitsu; Hoshi, Tomohiro; Yamane, Kazuyuki; Sato, Hiroyuki

PATENT ASSIGNEE(S): Kureha Chemical Industry Co., Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 9 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 2003252975	A2	20030910	JP 2002-381165	20021227

PRIORITY APPLN. INFO.: JP 2001-396972 A 20011227

AB The aliphatic polyester is manufactured by continuous supply of (a)  $\geq 1$  monomer selected from **cyclic ester** (prepolymer), (b) a **polymerization** catalyst, and (c) a compound having melt viscosity higher than that of the monomer and providing uniform melted composition with the monomer at a **polymerization** temperature in an melt extruder. Thus, a melt extruder was operated under continuous supply of a mixture of 6 kg glycolide, 2 g SnCl<sub>4</sub>·5H<sub>2</sub>O, and 400 g poly(glycolic acid) to give polyglycolide showing weight degradation ratio 0.6% after 2-h operation and

0.6%

after 6-h operation, i.e., retention of quality in continuous melt extrusion.

IT 26202-08-4P, Glycolide homopolymer

RL: **IMF** (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); **PREP** (Preparation);

PROC (Process)

(manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of additive with high melt viscosity)

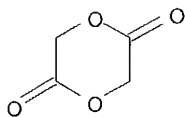
RN 26202-08-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

CMF C4 H4 O4



- IC ICM C08G063-78  
ICS C08G063-08; C08L067-00; C08L101-16
- CC 38-2 (Plastics Fabrication and Uses)
- ST aliph polyester manuf stable melt extrusion; **cyclic ester polymn** aliph polyester; glycolide **polymn** polyglycolic acid additive
- IT Polyesters, processes  
RL: IMF (Industrial manufacture); PEP (Physical, engineering or chemical process); PYP (Physical process); **PREP (Preparation)**; PROC (Process)  
(aliphatic; manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of additive with high melt viscosity)
- IT Extrusion apparatus  
Extrusion of plastics and rubbers  
Heat-resistant materials  
**Polymerization** catalysts  
(manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of additive with high melt viscosity)
- IT 26811-96-1  
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(assumed monomers; manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of additive with high melt viscosity)
- IT 26009-03-0P, Poly[oxy(1-oxo-1,2-ethanediyl)] 26202-08-4P, Glycolide homopolymer  
RL: **IMF (Industrial manufacture)**; PEP (Physical, engineering or chemical process); PYP (Physical process); **PREP (Preparation)**; PROC (Process)  
(manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of additive with high melt viscosity)
- IT 26124-68-5, Poly(glycolic acid) 26161-42-2, Lacty 9400  
RL: MOA (Modifier or additive use); PEP (Physical, engineering or chemical process); PYP (Physical process); PROC (Process); USES (Uses)  
(manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of additive with high melt viscosity)
- IT 7646-78-8, Tin chloride (SnCl<sub>4</sub>), uses  
RL: CAT (Catalyst use); USES (Uses)  
(**polymerization** catalyst; manufacture of aliphatic polyester by continuous melt extrusion of **cyclic ester** in presence of



additive with high melt viscosity)

L32 ANSWER 6 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:490165 CAPLUS

DOCUMENT NUMBER: 139:180394

TITLE: Strontium-based initiator system for ring-opening  
**polymerization of cyclic esters**

AUTHOR(S): Tang, Zhaohui; Chen, Xuesi; Liang, Qizhi; Bian,  
Xinchao; Yang, Lixin; Piao, Longhai; Jing, Xiabin

CORPORATE SOURCE: State Key Laboratory of Polymer Physics and Chemistry,  
Changchun Institute of Applied Chemistry, Chinese  
Academy of Sciences, Changchun, 130022, Peop. Rep.  
China

SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry  
(2003), 41(13), 1934-1941  
CODEN: JPACEC; ISSN: 0887-624X

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An amino isopropoxyl strontium (Sr-PO) initiator, which was prepared by the reaction of propylene oxide with liquid strontium ammoniate solution, was used to carry out the ring-opening **polymerization** (ROP) of **cyclic esters** to obtain aliphatic polyesters, such as poly( $\epsilon$ -caprolactone) (PCL) and poly(L-lactide) (PLLA). The Sr-PO initiator demonstrated an effective initiating activity for the ROP of  $\epsilon$ -caprolactone ( $\epsilon$ -CL) and L-lactide (LLA) under mild conditions and adjusted the mol. weight by the ratio of monomer to Sr-PO initiator. Block copolymer PCL-b-PLLA was prepared by sequential **polymerization** of  $\epsilon$ -CL and LLA, which was demonstrated by <sup>1</sup>H NMR, <sup>13</sup>C NMR, and gel permeation chromatog. The chemical structure of Sr-PO initiator was confirmed by elemental anal. of Sr and N, <sup>1</sup>H NMR anal. of the end groups in  $\epsilon$ -CL oligomer, and FTIR spectroscopy. The end groups of PCL were hydroxyl and isopropoxycarbonyl, and FTIR spectroscopy showed a coordination between Sr-PO initiator and the model monomer  $\gamma$ -butyrolactone. These exptl. facts indicated that the ROP of **cyclic esters** followed a coordination-insertion mechanism, and **cyclic esters** exclusively inserted into the Sr-O bond.

IT 33135-50-1P, Poly(L-lactide) 111821-20-6P,  
 $\epsilon$ -Caprolactone-(L-lactide) block copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)  
(preparation with strontium-based initiator system)

RN 33135-50-1 CAPLUS

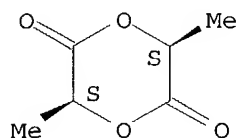
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



RN 111821-20-6 CAPLUS

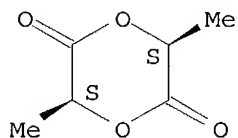
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone, block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

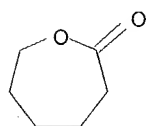
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



CC 35-3 (Chemistry of Synthetic High Polymers)

ST strontium catalyst ring opening **polymn** lactone

IT Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(Preparation)

(lactone-based; preparation with strontium-based initiator system)

IT Molecular weight

(of polylactones prepared in presence of strontium catalyst)

IT **Polymerization** kinetics

(ring-opening; of lactones in presence of strontium catalyst)

IT **Polymerization** catalysts

- (ring-opening; **polymerization** of lactones in presence of strontium catalyst)
- IT 96-48-0D,  $\gamma$ -Butyrolactone, complexes with isopropoxystrotrium amide  
578732-12-4D, complexes with  $\gamma$ -butyrolactone  
RL: FMU (Formation, unclassified); FORM (Formation, nonpreparative)  
(in mechanism of ring-opening **polymerization** of lactones in presence of strontium catalyst)
- IT 502-44-3,  $\epsilon$ -Caprolactone 4511-42-6, L-Lactide  
RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
(kinetics of ring-opening **polymerization** of lactones in presence of strontium catalyst)
- IT 578732-12-4P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); **PREP** (Preparation); USES (Uses)  
(preparation of strontium-based catalyst for ring-opening **polymerization** of lactones)
- IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
Poly[oxy(1-oxo-1,6-hexanediyl)] 26161-42-2P 33135-50-1P,  
Poly(L-lactide) 111821-20-6P,  $\epsilon$ -Caprolactone- (L-lactide)  
block copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP** (Preparation)  
(preparation with strontium-based initiator system)
- IT 75-56-9, Propylene oxide, reactions 7440-24-6, Strontium, reactions  
7664-41-7, Ammonia, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; preparation of strontium-based catalyst for ring-opening **polymerization** of lactones)
- IT 88863-33-6, Strontium isopropoxide  
RL: CAT (Catalyst use); USES (Uses)  
(strontium-based catalysts for ring-opening **polymerization** of lactones)

REFERENCE COUNT: 34 THERE ARE 34 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 7 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:340375 CAPLUS

DOCUMENT NUMBER: 139:117703

TITLE: Ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst

AUTHOR(S): Piao, Long-Hai; Zhang, Xin-Zhao; Chen, Xue-Si; Deng, Ming-Xiao; Jiang, Lian-Sheng; Jing, Xia-Bin

CORPORATE SOURCE: (State Key Laboratory of Polymer Physics and Chemistry, Changchun Institute of Applied Chemistry, Chinese Academy of Sciences, Changchun, 130022, Peop. Rep. China

SOURCE: Gaodeng Xuexiao Huaxue Xuebao (2003), 24(2), 346-349  
CODEN: KTHPDM; ISSN: 0251-0790

PUBLISHER: Gaodeng Jiaoyu Chubanshe

DOCUMENT TYPE: Journal

LANGUAGE: Chinese

AB .vepsiln.-Caprolactone and L-lactide were ring-opening **polymerized** by using calcium catalysts treated with propylene oxide and acetonitrile/(propylene oxide). The influences of catalyst concentration and aging temperature, **polymerization** time and temperature on mol. weight of the polymers

were studied. This catalyst exhibited high reactivity and some "quasi-living-**polymerization**" character and the mol. weight of the polyester could be controlled by adjusting the mass ratio of monomer to catalyst. Aging treatment of the catalyst and employment of the second organic modifier, acetonitrile, resulted in a higher mol. weight of the polymers. The highest mol. weight obtained was 270 000.

IT 33135-50-1P, L-Lactide, homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

RN 33135-50-1 CAPLUS

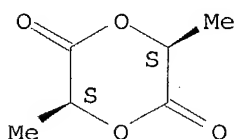
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-3 (Chemistry of Synthetic High Polymers)

ST ring opening **polymn** lactide caprolactone org amino catalyst

IT Molecular weight

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

IT Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

IT **Polymerization** catalysts

(ring-opening; ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

IT 7440-70-2DP, Calcium, reaction products with ammonia 7664-41-7DP,

Ammonia, reaction products with calcium

RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP (Preparation); USES (Uses)

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

IT 75-05-8, Acetonitrile, uses 75-56-9, Propylene oxide, uses

RL: MOA (Modifier or additive use); USES (Uses)

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

IT 24980-41-4P, .vepsiln.-Caprolactone, homopolymer 25248-42-4P, .vepsiln.-Caprolactone, homopolymer, sru 26161-42-2P, L-Lactide, homopolymer, sru 33135-50-1P, L-Lactide, homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

IT 7440-70-2, Calcium, reactions 7664-41-7, Ammonia, reactions

RL: RCT (Reactant); RACT (Reactant or reagent)

(ring-opening **polymerization** of aliphatic **cyclic esters** by using organic amino calcium catalyst modified by acrylonitrile/propylene oxide)

L32 ANSWER 8 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2003:266434 CAPLUS

DOCUMENT NUMBER: 139:7318

TITLE: Biodegradable Polymersomes

AUTHOR(S): Meng, Fenghua; Hiemstra, Christine; Engbers, Gerard H. M.; Feijen, Jan

CORPORATE SOURCE: Institute for Biomedical Technology (BMTI), Polymer Chemistry and Biomaterials Group, Department of Chemical Technology, University of Twente, Enschede, 7500, Neth.

SOURCE: Macromolecules (2003), 36(9), 3004-3006

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB This communication reported the preparation of biodegradable polymersomes from amphiphilic block copolymers based on PEG and polyesters or polycarbonates. All block copolymers were synthesized by ring-opening **polymerization** of **cyclic esters**, e.g., DL-lactide (DLA),  $\epsilon$ -caprolactone (CL), or carbonates, e.g., trimethylene carbonate (TMC), in the presence of zinc bis[bis(trimethylsilyl)amide] (97 % ) and monomethoxypoly(ethylene glycol) (methoxy PEG, 5800 and 1200) at room temperature. Similar to the calcium bis[bis(trimethylsilyl)amide] catalyst system, zinc bis[bis(trimethylsilyl)amide] combined with methoxy PEG initiated the ring-opening **polymerization** of lactides and lactones with high conversion, affording block copolymers with a controlled mol. weight and low polydispersity index. Besides its high activity, its low toxicity

renders the zinc-based catalyst attractive for the synthesis of copolymers for in vivo applications.

IT 168399-10-8P, DL-Lactide-oxirane block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and characterization of block copolymers biodegradable polymersomes)

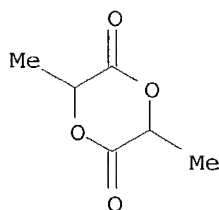
RN 168399-10-8 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CM 2

CRN 75-21-8

CMF C2 H4 O



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 36

ST polyoxyethylene polyester block copolymer biodegradable polymersome prepn property

IT Biodegradable materials

(block polyesters; preparation and characterization of block copolymers biodegradable polymersomes)

IT Polyethers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(polycarbonate-, block; preparation and characterization of block copolymers biodegradable polymersomes)

IT Polyethers, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(polyester-, block; preparation and characterization of block copolymers biodegradable polymersomes)

IT Polycarbonates, preparation  
Polyesters, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
**(Preparation)**  
(polyether-, block; preparation and characterization of block copolymers biodegradable polymersomes)

IT Liposomes  
Molecular weight  
Polydispersity  
Polymer morphology  
(preparation and characterization of block copolymers biodegradable polymersomes)

IT **Polymerization**  
(ring-opening; in preparation and characterization of block copolymers biodegradable polymersomes)

IT 107596-21-4P,  $\epsilon$ -Caprolactone-oxirane block copolymer  
168399-10-8P, DL-Lactide-oxirane block copolymer 211870-02-9P,  
Oxirane-trimethylene carbonate block copolymer  
RL: PRP (Properties); **SPN (Synthetic preparation); PREP**  
**(Preparation)**  
(preparation and characterization of block copolymers biodegradable polymersomes)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 9 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2003:58143 CAPLUS  
DOCUMENT NUMBER: 138:107614  
TITLE: Polyhydroxycarboxylic acid and its production process  
INVENTOR(S): Yamane, Kazuyuki; Kawakami, Yukichika  
PATENT ASSIGNEE(S): Kureha Chemical Industry Co., Ltd., Japan  
SOURCE: PCT Int. Appl., 64 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent  
LANGUAGE: English  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
WO 2003006525	A1	20030123	WO 2002-JP6835	20020705
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL,			

PT, SE, SK, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR,  
NE, SN, TD, TG

EP 1404738 A1 20040407 EP 2002-745856 20020705

R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
IE, SI, LT, LV, FI, RO, MK, CY, AL, TR, BG, CZ, EE, SK

PRIORITY APPLN. INFO.: JP 2001-208801 A 20010710  
JP 2001-208804 A 20010710  
WO 2002-JP6835 W 20020705

AB Polyhydroxycarboxylic acid obtained by ring-opening **polymerization** of  
**cyclic esters** (e.g., glycolide) has a precisely  
controlled rate of biodegradability. The polymer has Mw 10,000-1,000,000,  
Mw/Mn 1.0-2.5, and yellowness index (YI)  $\leq 40$ .

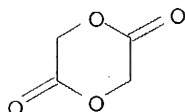
IT 26202-08-4P, Glycolide homopolymer  
RL: IMF (Industrial manufacture); PRP (Properties); TEM  
(Technical or engineered material use); PREP (Preparation); USES  
(Uses)  
(preparation of polyhydroxycarboxylic acids with controlled rate of  
biodegradability and low yellowness index)

RN 26202-08-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6  
CMF C4 H4 O4



IC ICM C08G063-08

CC 37-3 (Plastics Manufacture and Processing)

ST biodegradability glycolide polymer; biodegradable polyhydroxycarboxylic  
acid; ring opening **polymn** glycolide

IT Polyesters, preparation  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or  
engineered material use); PREP (Preparation); USES (Uses)  
(aliphatic; preparation of polyhydroxycarboxylic acids with controlled rate  
of  
biodegradability and low yellowness index)

IT Biodegradable materials  
(preparation of polyhydroxycarboxylic acids with controlled rate of  
biodegradability and low yellowness index)

IT 26009-03-0P, Glycolide homopolymer, sru 26202-08-4P, Glycolide  
homopolymer  
RL: IMF (Industrial manufacture); PRP (Properties); TEM  
(Technical or engineered material use); PREP (Preparation); USES  
(Uses)  
(preparation of polyhydroxycarboxylic acids with controlled rate of



biodegradability and low yellowness index)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 10 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:831082 CAPLUS

DOCUMENT NUMBER: 138:137696

TITLE: Ring opening polymerisations of **cyclic esters** and carbonate by rare-earth LnCp<sub>3</sub>

AUTHOR(S): Agarwal, Seema; Puchner, Mario

CORPORATE SOURCE: Kern-chemie und Makromolekulare Chemie und Wissenschaftliches Zentrum für Materialwissenschaften, Fachbereich Chemie, Philipps-Universität Marburg, Institut für Physikalische Chemie, Marburg, D-35032, Germany

SOURCE: European Polymer Journal (2002), 38(12), 2365-2371

CODEN: EUPJAG; ISSN: 0014-3057

PUBLISHER: Elsevier Science Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The ring opening **polymerization of cyclic esters** ( $\epsilon$ -caprolactone and L-lactide) and cyclic carbonate (1,3-dioxan-2-one (TMC)) initiated with LnCp<sub>3</sub> complexes (Ln=Sm, Er, Pr, Gd and Ce) is reported. The size of the metal atom has an effect on the catalytic activity. The order of reactivity was found to be Er.apprx.Gd>Sm>Pr>Ce. The polyester chains were found to be living for successful synthesis of block copolymers. Polycarbonate (polyTMC) was obtained without CO<sub>2</sub> elimination using LnCp<sub>3</sub> as an initiator.

IT 33135-50-1P, L-Lactide homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(ring-opening **polymns. of cyclic ester** and trimethylene carbonate by lanthanide complex catalysts)

RN 33135-50-1 CAPLUS

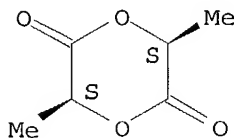
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IT 111821-20-6P,  $\epsilon$ -Caprolactone-L-lactide block copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (ring-opening polymns. of cyclic ester  
 and trimethylene carbonate by lanthanide complex catalysts)

RN 111821-20-6 CAPLUS

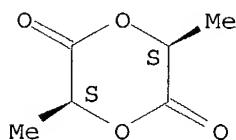
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone,  
 block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

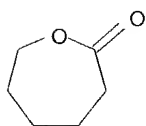
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



CC 35-7 (Chemistry of Synthetic High Polymers)

ST lanthanide catalyst polymn cyclic ester  
 carbonate; caprolactone ring opening polymn catalyst lanthanide;  
 lactide ring opening polymn catalyst lanthanide; dioxanone ring  
 opening polymn catalyst lanthanide; samarium polymn  
 catalyst cyclic ester carbonate; erbium polymn  
 catalyst cyclic ester carbonate; praseodymium  
 polymn catalyst cyclic ester carbonate;  
 gadolinium polymn catalyst cyclic ester  
 carbonate; cerium polymn catalyst cyclic ester  
 carbonate

IT Optical activity  
 (of polylactide prepared by lanthanide complex catalysts)

IT Polycarbonates, preparation  
 Polyesters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (ring-opening polymns. of cyclic ester  
 and trimethylene carbonate by lanthanide complex catalysts)

IT **Polymerization catalysts**  
 (ring-opening; ring-opening polymns. of cyclic  
 ester and trimethylene carbonate by lanthanide complex  
 catalysts)

IT 1272-21-5, Tricyclopentadienylgadolinium 1298-53-9 1298-55-1,  
 Tricyclopentadienylsamarium 11077-59-1, Tricyclopentadienylpraseodymium  
 39330-74-0, Tricyclopentadienylerbium  
 RL: CAT (Catalyst use); USES (Uses)  
 (ring-opening polymns. of cyclic ester  
 and trimethylene carbonate by lanthanide complex catalysts)

IT 26161-42-2P, L-Lactide homopolymer, sru 33135-50-1P, L-Lactide  
 homopolymer  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (ring-opening polymns. of cyclic ester  
 and trimethylene carbonate by lanthanide complex catalysts)

IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  
 $\epsilon$ -Caprolactone homopolymer, sru 31852-84-3P, Trimethylene  
 carbonate homopolymer 50862-75-4P, Trimethylene carbonate homopolymer,  
 sru 111821-20-6P,  $\epsilon$ -Caprolactone-L-lactide block  
 copolymer  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (ring-opening polymns. of cyclic ester  
 and trimethylene carbonate by lanthanide complex catalysts)

REFERENCE COUNT: 25 THERE ARE 25 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 11 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:814207 CAPLUS

DOCUMENT NUMBER: 137:325796

TITLE: Use of zinc derivatives as cyclic  
 ester polymerization catalysts

INVENTOR(S): Dumitrescu, Anca; Martin-Vaca, Blanca; Gornitzka,  
 Heinz; Bourissou, Didier; Cazaux, Jean-Bernard;  
 Bertrand, Guy

PATENT ASSIGNEE(S): Societe De Conseils De Recherches Et D'applications  
 Scientifiques (S.C.R.A.S.), Fr.; Centre National de la  
 Recherche Scientifique CNRS

SOURCE: PCT Int. Appl., 19 pp.  
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

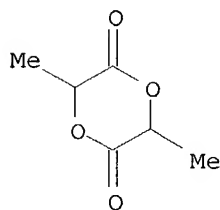
LANGUAGE: French

FAMILY ACC. NUM. COUNT: 1

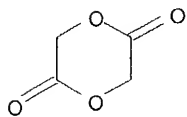
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 2002083761	A1	20021024	WO 2002-FR1220	20020409
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN,				
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH,				
GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR,				
LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH,				

PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ,  
 UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU,  
 TJ, TM  
 RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH,  
 CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR,  
 BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG  
 EP 1392752 A1 20040303 EP 2002-761923 20020409  
 R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT,  
 IE, SI, LT, LV, FI, RO, MK, CY, AL, TR  
 NO 2003004530 A 20031209 NO 2003-4530 20031009  
 PRIORITY APPLN. INFO.: EP 2001-400926 A 20010410  
 WO 2002-FR1220 W 20020409  
 OTHER SOURCE(S): MARPAT 137:325796  
 AB The invention concerns the use of zinc derivs. such as [(Me<sub>3</sub>Si)<sub>2</sub>N]<sub>2</sub>Zn as  
 (co)polymerization catalysts of cyclic esters such  
 as ε-caprolactone and cyclic esters or lactic  
 and glycolic acid in solution or solid phase.  
 IT 26680-10-4P, Polylactide 26780-50-7P, Glycolide-lactide  
 copolymer 184851-41-0P 473424-25-8P  
 473424-27-0P 473424-29-2P  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (use of zinc derivs. as cyclic ester polymn  
 . catalysts)  
 RN 26680-10-4 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 95-96-5  
 CMF C6 H8 O4



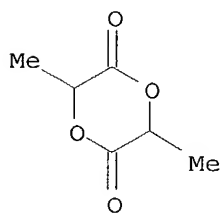
RN 26780-50-7 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione  
 (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 502-97-6  
 CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



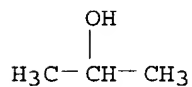
RN 184851-41-0 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer, 1-methylethyl ester  
(9CI) (CA INDEX NAME)

CM 1

CRN 67-63-0

CMF C3 H8 O



CM 2

CRN 26680-10-4

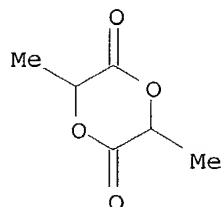
CMF (C6 H8 O4) x

CCI PMS

CM 3

CRN 95-96-5

CMF C6 H8 O4

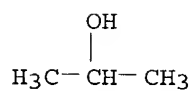


RN 473424-25-8 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer, 1-methylethyl ester, acetate (9CI) (CA INDEX NAME)

CM 1

CRN 67-63-0

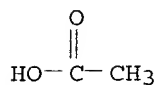
CMF C3 H8 O



CM 2

CRN 64-19-7

CMF C2 H4 O2



CM 3

CRN 26680-10-4

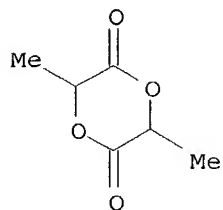
CMF (C6 H8 O4) x

CCI PMS

CM 4

CRN 95-96-5

CMF C6 H8 O4

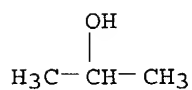


RN 473424-27-0 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione,  
 1-methylethyl ester (9CI) (CA INDEX NAME)

CM 1

CRN 67-63-0

CMF C3 H8 O



CM 2

CRN 26780-50-7

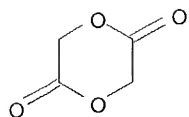
CMF (C6 H8 O4 . C4 H4 O4)x

CCI PMS

CM 3

CRN 502-97-6

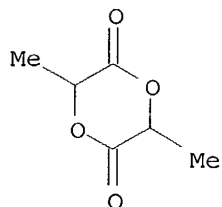
CMF C4 H4 O4



CM 4

CRN 95-96-5

CMF C6 H8 O4



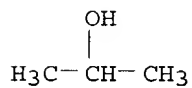
RN 473424-29-2 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione,  
1-methylethyl ester, block (9CI) (CA INDEX NAME)

CM 1

CRN 67-63-0

CMF C3 H8 O



CM 2

CRN 107131-72-6

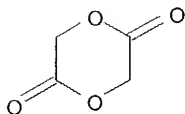
CMF (C6 H8 O4 . C4 H4 O4) x

CCI PMS

CM 3

CRN 502-97-6

CMF C4 H4 O4

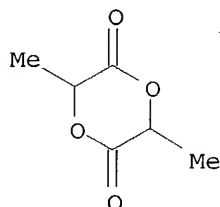


CM 4

CRN 95-96-5

CMF C6 H8 O4





IC ICM C08G063-82  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 67  
 ST zinc trimethylsilylamide catalyst ring opening **polymn**  
**cyclic ester**; glycolide **polymn** zinc  
 trimethylsilylamide catalyst; lactide **polymn** zinc  
 trimethylsilylamide catalyst; caprolactone **polymn** zinc  
 trimethylsilylamide catalyst  
 IT Polyesters, preparation  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (aliphatic; use of zinc derivs. as **cyclic ester**  
**polymerization** catalysts)  
 IT **Polymerization** catalysts  
 (ring-opening; use of zinc derivs. as **cyclic ester**  
**polymerization** catalysts)  
 IT 3999-27-7  
 RL: CAT (Catalyst use); USES (Uses)  
 (use of zinc derivs. as **cyclic ester polymn**  
 . catalysts)  
 IT 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P  
 , Polylactide 26780-50-7P, Glycolide-lactide copolymer  
 157865-02-6P 184851-41-0P 473249-86-4P 473424-25-8P  
 473424-27-0P 473424-29-2P  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (use of zinc derivs. as **cyclic ester polymn**  
 . catalysts)  
 REFERENCE COUNT: 2 THERE ARE 2 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 12 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:753707 CAPLUS  
 DOCUMENT NUMBER: 138:39587  
 TITLE: Soluble tin(II) macroinitiator adducts for the  
 controlled ring-opening **polymerization** of  
 lactones and cyclic carbonates  
 AUTHOR(S): Storey, R. F.; Mullen, B. D.; Desai, G. S.; Sherman,  
 J. W.; Tang, C. N.  
 CORPORATE SOURCE: School of Polymers and High Performance Materials,  
 University of Southern Mississippi, Hattiesburg, MS,  
 39406, USA  
 SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry  
 (2002), 40(20), 3434-3442

CODEN: JPACEC; ISSN: 0887-624X

PUBLISHER: John Wiley &amp; Sons, Inc.

DOCUMENT TYPE: Journal

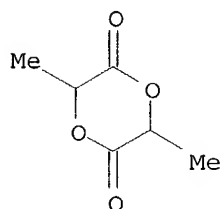
LANGUAGE: English

- AB Polyesters and poly(ester carbonates) were synthesized via ring-opening **polymerization** with tin(II) macroinitiator adducts containing oligomeric L-lactide (LLA), rac-lactide (rac-LA), and  $\epsilon$ -caprolactone (CL). The initiating species were synthesized by the reaction of LLA, rac-LA, or CL with  $\text{Sn}(\text{OEt})_2$  (monomer concentration/initiator concentration  $\leq 20$ ) and then were dissolved in methylene chloride or toluene and stored in a stoppered flask for the subsequent ring-opening **polymerization** of **cyclic esters** and carbonates. The soluble tin alkoxide macroinitiators yielded predictable and quant. initiation of **polymerization** for up to 1 mo of storage time at room temperature. The resulting polymers displayed low polydispersity ( $\leq 1.5$ ), and a high monomer conversion ( $>95\%$ ) was obtained within relatively short **polymerization** times ( $\leq 2$  h). Adjusting the monomer/macroinitiator ratio effectively controlled the mol. weight of the polymers. NMR was used to characterize the initiating species and polymer microstructure, and size exclusion chromatog. was used to determine the mol. weight properties of the polymers.
- IT 26680-10-4DP, Poly(D,L-lactide), adducts with tin diethoxide  
 RL: CAT (Catalyst use); **SPN (Synthetic preparation)**; **PREP (Preparation)**; USES (Uses)  
 (ROP initiator; preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use in controlled ring-opening **polymerization** of lactones and cyclic carbonates)
- RN 26680-10-4 CAPLUS
- CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



- IT 33135-50-1DP, Poly(L-lactide), adducts with tin diethoxide  
 RL: CAT (Catalyst use); **SPN (Synthetic preparation)**; **PREP (Preparation)**; USES (Uses)  
 (preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use in controlled ring-opening **polymerization** of lactones and cyclic carbonates)
- RN 33135-50-1 CAPLUS

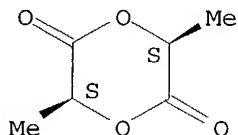
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IT 26680-10-4P, Poly(D,L-lactide)

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use in controlled ring-opening polymerization of lactones and cyclic carbonates)

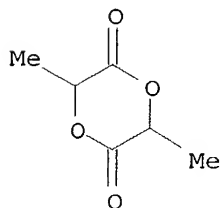
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-3 (Chemistry of Synthetic High Polymers)

ST tin ethoxide lactide adduct macroinitiator ring opening polymn; cyclic ester ring opening polymn

macroinitiator polyester prepn; carbonate ring opening polymn

macroinitiator polyester polycarbonate

IT Polyesters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(polycarbonate-; preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use in controlled ring-opening polymerization of lactones and cyclic carbonates)

IT Polycarbonates, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (polyester-; preparation soluble tin(II)-cyclic lactone macroinitiator  
 adducts  
 and use in controlled ring-opening **polymerization** of lactones and  
 cyclic carbonates)

IT NMR (nuclear magnetic resonance)  
 Polydispersity  
 (preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use  
 in  
 controlled ring-opening **polymerization** of lactones and cyclic  
 carbonates)

IT Polyesters, preparation  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use  
 in  
 controlled ring-opening **polymerization** of lactones and cyclic  
 carbonates)

IT **Polymerization** catalysts  
 (ring-opening, macroinitiators; preparation soluble tin(II)-cyclic lactone  
 macroinitiator adducts and use in controlled ring-opening  
**polymerization** of lactones and cyclic carbonates)

IT **Polymerization**  
 (ring-opening; preparation soluble tin(II)-cyclic lactone macroinitiator  
 adducts and use in controlled ring-opening **polymerization** of  
 lactones and cyclic carbonates)

IT 14791-99-2DP, Tin diethoxide, adducts with oligomeric lactides  
 24980-41-4DP, Poly( $\epsilon$ -caprolactone), adducts with tin diethoxide  
 25248-42-4DP, Poly[oxy(1-oxo-1,6-hexanediyl)], adducts with tin diethoxide  
 26023-30-3DP, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)], adducts with tin  
 diethoxide 26161-42-2DP, adducts with tin diethoxide  
 26680-10-4DP, Poly(D,L-lactide), adducts with tin diethoxide  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (ROP initiator; preparation soluble tin(II)-cyclic lactone macroinitiator  
 adducts and use in controlled ring-opening **polymerization** of  
 lactones and cyclic carbonates)

IT 33135-50-1DP, Poly(L-lactide), adducts with tin diethoxide  
 RL: CAT (Catalyst use); SPN (Synthetic preparation); PREP  
 (Preparation); USES (Uses)  
 (preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use  
 in  
 controlled ring-opening **polymerization** of lactones and cyclic  
 carbonates)

IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
 Poly[oxy(1-oxo-1,6-hexanediyl)] 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-  
 ethanediyl)] 26680-10-4P, Poly(D,L-lactide) 31852-84-3P,  
 Trimethylene carbonate polymer 50862-75-4P, Trimethylene carbonate  
 polymer, SRU  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation soluble tin(II)-cyclic lactone macroinitiator adducts and use  
 in  
 controlled ring-opening **polymerization** of lactones and cyclic

carbonates)

REFERENCE COUNT: 21 THERE ARE 21 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 13 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2002:676078 CAPLUS  
 DOCUMENT NUMBER: 137:201738  
 TITLE: Method for preparing polyesters having intrachain free acid functions  
 INVENTOR(S): Cazaux, Jean-Bernard; Brigati, Charles; Louchkoff, Alexandre  
 PATENT ASSIGNEE(S): Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), Fr.  
 SOURCE: PCT Int. Appl., 13 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2002068499	A1	20020906	WO 2002-FR655	20020222
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZM, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM				
RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG				
FR 2821360	A1	20020830	FR 2001-2630	20010227
FR 2821360	B1	20030530		
EP 1366105	A1	20031203	EP 2002-704876	20020222
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
NO 2003003783	A	20030826	NO 2003-3783	20030826
PRIORITY APPLN. INFO.:				
			FR 2001-2630	A 20010227
			WO 2002-FR655	W 20020222
AB Polyesters with mid-chain free acid groups are manufactured by polymn . of cyclic esters such as lactides and glycolides in the presence of tartaric acid diesters of (substituted) benzyl alc. and removal of the (substituted) benzyl groups.				
IT 452971-33-4DP, Dibenzyl tartrate-glycolide-L-lactide copolymer, hydrolyzed				
RL: IMF (Industrial manufacture); PREP (Preparation) (preparing polyesters having intrachain free acid functions)				
RN 452971-33-4 CAPLUS				
CN Butanedioic acid, 2,3-dihydroxy- (2R,3R)-, bis(phenylmethyl) ester, polymer with (3S,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione and				

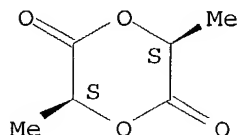
1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.

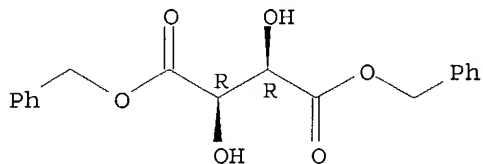


CM 2

CRN 622-00-4

CMF C18 H18 O6

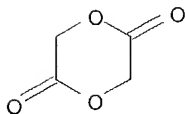
Absolute stereochemistry. Rotation (+).



CM 3

CRN 502-97-6

CMF C4 H4 O4



IT 452971-33-4P, Dibenzyl tartrate-glycolide-L-lactide copolymer

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(preparing polyesters having intrachain free acid functions)

RN 452971-33-4 CAPLUS

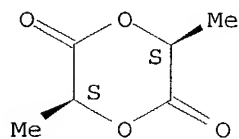
CN Butanedioic acid, 2,3-dihydroxy- (2R,3R)-, bis(phenylmethyl) ester, polymer with (3S,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione and 1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.

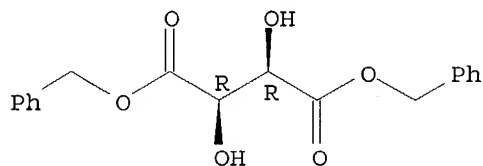


CM 2

CRN 622-00-4

CMF C18 H18 O6

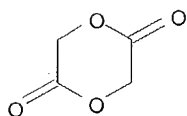
Absolute stereochemistry. Rotation (+).



CM 3

CRN 502-97-6

CMF C4 H4 O4



IC ICM C08G063-82

ICS C08G063-08

CC 35-5 (Chemistry of Synthetic High Polymers)

ST lactide glycolide polyester midchain acid group manuf; dibenzyl tartrate  
lactide glycolide polyester manuf

IT Polyesters, preparation

RL: IMF (Industrial manufacture); **PREP (Preparation)**

(aliphatic; preparing polyesters having intrachain free acid functions)

IT 452971-33-4DP, Dibenzyl tartrate-glycolide-L-lactide copolymer,

hydrolyzed

RL: IMF (Industrial manufacture); PREP (Preparation)

(preparing polyesters having intrachain free acid functions)

IT 452971-33-4P, Dibenzyl tartrate-glycolide-L-lactide copolymer

RL: IMF (Industrial manufacture); RCT (Reactant); PREP

(Preparation); RACT (Reactant or reagent)

(preparing polyesters having intrachain free acid functions)

REFERENCE COUNT: 4 THERE ARE 4 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 14 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:640603 CAPLUS

DOCUMENT NUMBER: 137:370432

TITLE: Kinetics and mechanism of **cyclic esters polymerization** initiated with covalent metal carboxylates, 5a end-group studies in the model  $\epsilon$ -caprolactone and L,L-dilactide/tin(II) and zinc octoate/butyl alcohol systems

AUTHOR(S): Libiszowski, Jan; Kowalski, Adam; Duda, Andrzej; Penczek, Stanislaw

CORPORATE SOURCE: Department of Polymer Chemistry, Center of Molecular and Macromolecular Studies, Polish Academy of Sciences, Lodz, PL-90-363, Pol.

SOURCE: Macromolecular Chemistry and Physics (2002), 203(10/11), 1694-1701

CODEN: MCHPES; ISSN: 1022-1352

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Ring-opening **polymns.** of  $\epsilon$ -caprolactone (CL) and L,L-dilactide (LA) initiated by tin(II) octoate ( $\text{Sn}(\text{Oct})_2$ ) and zinc octoate ( $\text{Zn}(\text{Oct})_2$ ) and co-initiated with Bu alc. (BuOH) carried out in THF as a solvent at 80° were studied. By means of MALDI-TOF mass spectrometry, the formation of several populations of polyester macromols. bearing various end-groups was revealed, namely for poly( $\epsilon$ -caprolactone) (PCL):  $\text{BuO}(\text{O})\text{C-PCL-OH}$  (A),  $\text{BuO}(\text{O})\text{C-PCL-Oct}$  (B),  $\text{HO}(\text{O})\text{C-PCL-OH}$  (C),  $\text{HO}(\text{O})\text{C-PCL-Oct}$  (D), and PCL cyclics (E), and for poly(L-lactide) (PLA):  $\text{BuO}(\text{O})\text{C-PLA-OH}$  (A'),  $\text{BuO}(\text{O})\text{C-PLA-Oct}$  (B'),  $\text{HO}(\text{O})\text{C-PLA-OH}$  (C'), and  $\text{HO}(\text{O})\text{C-PLA-Oct}$  (D') (where  $\text{Bu}=\text{C}_4\text{H}_9$  and  $\text{Oct}=\text{O}(\text{O})\text{CCH}(\text{C}_2\text{H}_5)\text{C}_4\text{H}_9$ ). In these **polymns.** the end-groups in the originally formed macromols. change slowly with time. In the LA/ $\text{Sn}(\text{Oct})_2/\text{BuOH}$  system at the beginning of **polymerization** almost exclusively macromols. of the structure A' are formed and then structures B', C', and D' start to appear, however, after a period more than 300 times (at 80°C) longer than that required for full monomer conversion, these macromols. give exclusively esterified B' and D' chains. With  $\text{Zn}(\text{Oct})_2/\text{BuOH}$  all of these processes are much slower and less selective.

IT 33135-50-1P, L-Lactide polymer 475097-33-7P

475097-34-8P 475097-35-9P

RL: PRP (Properties); SPN (Synthetic preparation); PREP



(Preparation)

(end-group studies in caprolactone and dilactide/tin(II) and zinc octoate/butyl alc. systems)

RN 33135-50-1 CAPLUS

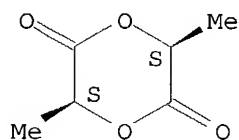
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



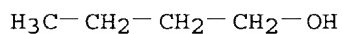
RN 475097-33-7 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer, butyl ester (9CI) (CA INDEX NAME)

CM 1

CRN 71-36-3

CMF C4 H10 O



CM 2

CRN 33135-50-1

CMF (C6 H8 O4)x

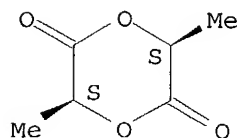
CCI PMS

CM 3

CRN 4511-42-6

CMF C6 H8 O4

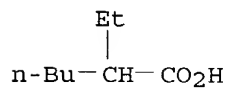
Absolute stereochemistry.



RN 475097-34-8 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer,  
2-ethylhexanoate (9CI) (CA INDEX NAME)

CM 1

CRN 149-57-5  
CMF C8 H16 O2



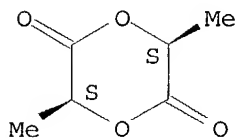
CM 2

CRN 33135-50-1  
CMF (C6 H8 O4)x  
CCI PMS

CM 3

CRN 4511-42-6  
CMF C6 H8 O4

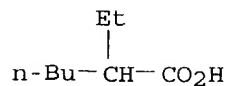
Absolute stereochemistry.



RN 475097-35-9 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer, butyl ester,  
2-ethylhexanoate (9CI) (CA INDEX NAME)

CM 1

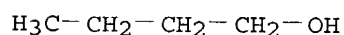
CRN 149-57-5  
CMF C8 H16 O2



CM 2

CRN 71-36-3

CMF C4 H10 O



CM 3

CRN 33135-50-1

CMF (C6 H8 O4)x

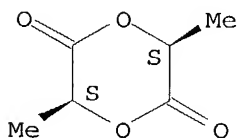
CCI PMS

CM 4

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-7 (Chemistry of Synthetic High Polymers)

ST caprolactone dilactide tin zinc octoate butanol catalyst

IT **Polymerization** catalysts

(end-group studies in caprolactone and dilactide/tin(II) and zinc octoate/butyl alc. systems)

IT Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); **PREP**

(**Preparation**)

(end-group studies in caprolactone and dilactide/tin(II) and zinc octoate/butyl alc. systems)

IT 136-53-8, Zinc octoate 301-10-0, Tin octoate

RL: CAT (Catalyst use); USES (Uses)

(end-group studies in caprolactone and dilactide/tin(II) and zinc octoate/butyl alc. systems)

IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
Poly( $\epsilon$ -caprolactone) sru 26161-42-2P 33135-50-1P,  
L-Lactide polymer 60303-48-2P 60327-94-8P,  $\epsilon$ -Caprolactone  
homopolymer butyl ester 475096-60-7P 475096-61-8P 475096-62-9P  
475096-63-0P 475096-64-1P 475097-31-5P 475097-32-6P  
475097-33-7P 475097-34-8P 475097-35-9P

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(end-group studies in caprolactone and dilactide/tin(II) and zinc  
octoate/butyl alc. systems)

REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 15 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:635727 CAPLUS

DOCUMENT NUMBER: 137:311329

TITLE: **Polymerizations of Cyclic**

**Esters Catalyzed by Titanium Complexes Having**  
**Chalcogen-Bridged Chelating Diaryloxo Ligands**

AUTHOR(S): Takashima, Yoshinori; Nakayama, Yuushou; Watanabe,  
Kouji; Itono, Tetsuya; Ueyama, Norikazu; Nakamura,  
Akira; Yasuda, Hajime; Harada, Akira; Okuda, Jun

CORPORATE SOURCE: Department of Macromolecular Science Graduate School  
of Science, Osaka University, Osaka, 560-0043, Japan

SOURCE: Macromolecules (2002), 35(20), 7538-7544

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A series of titanium complexes having tellurium-bridged chelating  
bis(aryloxo)ligands,  $[\text{TiX}_2\{2,2'\text{-Te(4-Me-6-tBu-C}_6\text{H}_2\text{O)}_2\}]_2$  (5: X = Cl; 6: X  
= OiPr), catalyzed the ring-opening **polymerization of cyclic**  
**esters** such as  $\epsilon$ -caprolactone,  $\delta$ -valerolactone, and  
L-lactide. The strong dependence of **polymns.** on the solvent was  
observed in this catalytic system. When the **polymns.** of  
 $\epsilon$ -caprolactone and L-lactide were carried out in toluene at  
100°, tellurium-bridged bis(aryloxo)titanium complex 5 was found to  
give polymers with rather broad mol. weight distribution due to back-biting.  
When the **polymns.** of  $\epsilon$ -caprolactone and L-lactide was  
carried out in anisole or in dioxane at 100°, complex 5 was found  
to initiate the controlled **polymerization**, to result in quant. polymer  
yields and narrow mol. weight distributions (living nature). The diblock  
copolymers of L-lactide and  $\epsilon$ -caprolactone were also obtained with  
the catalyst system 5 in anisole. The diblock copolymers showed two  
melting endothermic at 44.7°-53.5° derived from the  
poly( $\epsilon$ -caprolactone) block and at 155.2°-156.8°  
derived from the poly(L-lactide) block.

IT 33135-50-1P, L-Lactide homopolymer 111821-20-6P,  
 $\epsilon$ -Caprolactone-L-lactide block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(**polymns.** of cyclic esters catalyzed by

titanium complexes having chalcogen-bridged chelating diaryloxo  
ligands)

RN 33135-50-1 CAPLUS

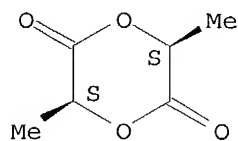
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



RN 111821-20-6 CAPLUS

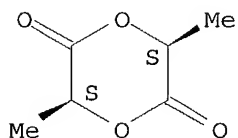
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone,  
block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

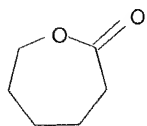
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67, 78

- ST caprolactone ring opening **polymn** chalcogen bridged titanium complex catalyst; valerolactone ring opening **polymn** chalcogen bridged titanium complex catalyst; lactide ring opening **polymn** chalcogen bridged titanium complex catalyst
- IT Polymers, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**  
 (biodegradable; **polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT Solvent effect  
 (on **polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT Molecular weight  
 Molecular weight distribution  
 (**polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT Polyesters, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); **PREP (Preparation)**  
 (**polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT Polymerization  
 Polymerization catalysts  
 (ring-opening; **polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT 57-57-8,  $\beta$ -Propiolactone  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (attempt **polymerization** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT 470693-05-1P  
 RL: SPN (Synthetic preparation); **PREP (Preparation)**  
 (model compound; **polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT 5593-70-4 104181-55-7 281199-61-9 281199-62-0 281199-64-2  
 281199-66-4 281199-67-5  
 RL: CAT (Catalyst use); USES (Uses)  
 (**polymerization catalyst; polymns. of cyclic esters** catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)
- IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  $\epsilon$ -Caprolactone homopolymer, sru 26161-42-2P, L-Lactide homopolymer, sru 26354-94-9P,  $\delta$ -Valerolactone homopolymer 26499-05-8P,  $\delta$ -Valerolactone homopolymer, sru 33135-50-1P, L-Lactide homopolymer 111821-20-6P,  $\epsilon$ -Caprolactone-L-lactide block copolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(polymns. of cyclic esters catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)

IT 502-44-3,  $\epsilon$ -Caprolactone

RL: RCT (Reactant); RACT (Reactant or reagent)

(polymns. of cyclic esters catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)

IT 100-66-3, Anisole, uses 108-88-3, Toluene, uses 123-91-1, Dioxane, uses

RL: NUU (Other use, unclassified); USES (Uses)

(solvent effect on polymns. of cyclic esters catalyzed by titanium complexes having chalcogen-bridged chelating diaryloxo ligands)

REFERENCE COUNT: 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 16 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:635171 CAPLUS

DOCUMENT NUMBER: 138:39553

TITLE: Synthesis of aliphatic polyesters of various architectures by the controlled ring-opening polymerization of cyclic esters

AUTHOR(S): Duda, Andrzej

CORPORATE SOURCE: Department of Polymer Chemistry, Center of Molecular and Macromolecular Studies, Polish Academy of Sciences, Lodz, 90-363, Pol.

SOURCE: Polimery (Warsaw, Poland) (2002), 47(7/8), 469-478  
CODEN: POLIA4; ISSN: 0032-2725

PUBLISHER: Instytut Chemii Przemyslowej

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB A review covering, 80 refs. presents recent studies on the controlled synthesis of poly(aliphatic ester)s (PAE's), mostly including poly(.vepsiln.-caprolactone) and poly(L-lactide). In the introduction, general features and practical applications of PAE's, the latter resulting mostly from ability of these polymers to (bio)degradation, are briefly discussed; polymerization methods leading to PAE's are also presented. Then, the ring-opening polymerization of .vepsiln.-caprolactone (CL) and L,L-dilactide (LA), including thermodyn. and kinetic polymerizability of CL and LA is described. Finally, recently elaborated methods of synthesis, of poly(.vepsiln.-caprolactone)s and poly(L-dilactide)s of various architectures, such as linear homopolymers, and star-shaped polymers are presented in a more detail.

IT 33135-50-1P, L-Lactide homopolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

(synthesis of aliphatic polyesters of various architectures by the controlled ring-opening polymerization of cyclic esters)

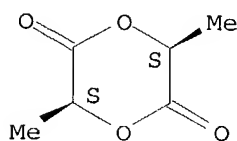
RN 33135-50-1 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-0 (Chemistry of Synthetic High Polymers)  
ST review **cyclic ester** ring opening **polymn**  
aliph polyester prepn; polycaprolactone prepn review; polylactide prepn  
review  
IT Polyesters, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(aliphatic; synthesis of aliphatic polyesters of various architectures by  
the controlled ring-opening **polymerization** of **cyclic  
esters**)  
IT **Polymerization**  
(ring-opening; synthesis of aliphatic polyesters of various architectures  
by the controlled ring-opening **polymerization** of **cyclic  
esters**)  
IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  
Poly[oxy(1-oxo-1,6-hexanediyl)] 26161-42-2P 33135-50-1P,  
L-Lactide homopolymer  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(synthesis of aliphatic polyesters of various architectures by the  
controlled ring-opening **polymerization** of **cyclic  
esters**)

REFERENCE COUNT: 82 THERE ARE 82 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 17 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:589682 CAPLUS

DOCUMENT NUMBER: 137:311208

TITLE: Control of Mn, Mw/Mn, end-groups, and kinetics in  
living **polymerization** of **cyclic  
esters**

AUTHOR(S): Biela, Tadeusz; Duda, Andrzej; Penczek, Stanislaw

CORPORATE SOURCE: Center of Molecular and Macromolecular Studies, Polish  
Academy of Science, Lodz, 90-363, Pol.

SOURCE: Macromolecular Symposia (2002), 183(IUPAC



International Symposium on Ionic Polymerization,  
2001), 1-10

CODEN: MSYMEC; ISSN: 1022-1360

PUBLISHER: Wiley-VCH Verlag GmbH  
DOCUMENT TYPE: Journal; General Review  
LANGUAGE: English

AB A review. Factors affecting molar mass, molar mass distribution, end-groups, and kinetics control in **polymerization** of  $\epsilon$ -caprolactone (CL) and L,L-dilactide (LA) initiated by covalent alkylmetal alkoxides, metal alkoxides, and metal carboxylates are discussed. First, an importance of the reliable molar mass measurements of the resulting polyesters is stressed. Then, it is shown that  $R_2AlOR'$ ,  $Al(OR)_3$ ,  $Sn(OR)_2$ , and  $Sn[(O)OCR']_2/ROH$  initiators provide living **polymerization of cyclic esters**, in spite of the extensive aggregation phenomena. In LA **polymerization**  $Sn(II)$ -alkoxides appeared to be particularly effective, allowing Mn control in the range from 102 up to 106. Conditions enabling side chain transfer reactions to be eliminated are also discussed.

IT 33135-50-1P, L-Lactide homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(control of Mn, Mw/Mn, end-groups, and kinetics in living **polymerization of cyclic esters** by metal alkoxides and metal carboxylates)

RN 33135-50-1 CAPLUS

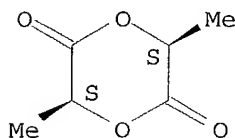
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-0 (Chemistry of Synthetic High Polymers)

ST review living **polymn** caprolactone lactide

IT Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(control of Mn, Mw/Mn, end-groups, and kinetics in living **polymerization of cyclic esters** by metal alkoxides and metal carboxylates)

IT **Polymerization catalysts**

**Polymerization kinetics**

(living; control of Mn, Mw/Mn, end-groups, and kinetics in living  
**polymerization of cyclic esters** by metal alkoxides  
 and metal carboxylates)

IT 502-44-3,  $\epsilon$ -Caprolactone 4511-42-6, L,L-Lactide  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (control of Mn, Mw/Mn, end-groups, and kinetics in living  
**polymerization of cyclic esters** by metal alkoxides  
 and metal carboxylates)

IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  
 $\epsilon$ -Caprolactone homopolymer, sru 26161-42-2P, L-Lactide  
 homopolymer, sru 33135-50-1P, L-Lactide homopolymer  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (control of Mn, Mw/Mn, end-groups, and kinetics in living  
**polymerization of cyclic esters** by metal alkoxides  
 and metal carboxylates)

REFERENCE COUNT: 45 THERE ARE 45 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 18 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:490573 CAPLUS

DOCUMENT NUMBER: 137:21008

TITLE: Method for preparation of biodegradable aliphatic  
 polyesters by using calcium organic compounds as ring  
 opening **polymerization** catalysts

INVENTOR(S): Jing, Xiabin; Chen, Xuesi; Zhang, Xinzha; Jiang,  
 Liansheng; Liang, Qizhi; Piao, Longhai

PATENT ASSIGNEE(S): Changchun Inst. of Applied Chemistry, Chinese Academy  
 of Sciences, Peop. Rep. China

SOURCE: Faming Zhuanli Shenqing Gongkai Shuomingshu, 8 pp.  
 CODEN: CNXXEV

DOCUMENT TYPE: Patent

LANGUAGE: Chinese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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CN 1306019	A	20010801	CN 2000-126534	20000913
CN 1114642	B	20030716		

PRIORITY APPLN. INFO.: CN 2000-126534 20000913

AB The polyesters (homopolymer, random copolymer or graft copolymer) are  
 prepared by open-ring **polymerization of cyclic esters**  
 (e.g.,  $\epsilon$ -caprolactone) or **cyclic esters** and  
**cyclic ether** (ethylene oxide or propylene oxide) in the presence  
 of calcium organic compds. in a ratio of monomer to Ca catalyst 50-1500 at  
 20-250° for 0.5-24 h.

IT 33135-50-1P, Poly(L-lactide) 65408-67-5P,  
 $\epsilon$ -Caprolactone-L-lactide copolymer 111821-20-6P,  
 $\epsilon$ -Caprolactone-L-lactide block copolymer 149479-29-8P,  
 Ethylene oxide-L-lactide block copolymer 171370-11-9P  
 389131-02-6P

RL: BUU (Biological use, unclassified); **IMF (Industrial manufacture)**; PRP (Properties); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)

(method for preparation of biodegradable aliphatic polyesters by using calcium

organic compds. as ring opening **polymerization** catalysts)

RN 33135-50-1 CAPLUS

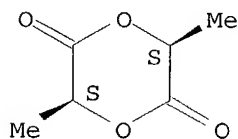
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



RN 65408-67-5 CAPLUS

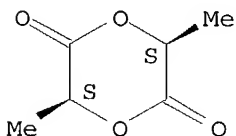
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

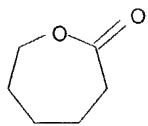
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2

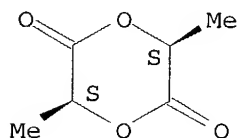


RN 111821-20-6 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone,  
block (9CI) (CA INDEX NAME)

CM 1

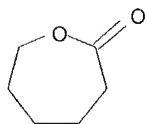
CRN 4511-42-6  
CMF C6 H8 O4

Absolute stereochemistry.



CM 2

CRN 502-44-3  
CMF C6 H10 O2

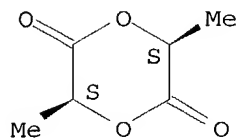


RN 149479-29-8 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with oxirane,  
block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6  
CMF C6 H8 O4

Absolute stereochemistry.



CM 2

CRN 75-21-8

CMF C2 H4 O



RN 171370-11-9 CAPLUS

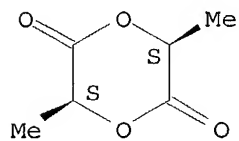
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with methyloxirane and oxirane, block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

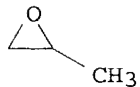
Absolute stereochemistry.



CM 2

CRN 75-56-9

CMF C3 H6 O



CM 3

CRN 75-21-8  
CMF C2 H4 O

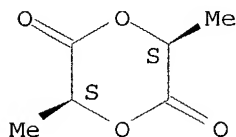


RN 389131-02-6 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
methyloxirane, block (9CI) (CA INDEX NAME)

CM 1

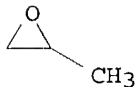
CRN 4511-42-6  
CMF C6 H8 O4

Absolute stereochemistry.



CM 2

CRN 75-56-9  
CMF C3 H6 O



IC ICM C08G063-42  
ICS C08G063-83  
CC 37-3 (Plastics Manufacture and Processing)  
Section cross-reference(s): 63  
ST polyester aliph prepn ring opening **polymn**; caprolactone polymer  
prepn calcium catalyst  
IT Polyesters, preparation  
RL: BUU (Biological use, unclassified); IMF (Industrial manufacture); PRP  
(Properties); BIOL (Biological study); **PREP (Preparation)**; USES  
(Uses)  
(aliphatic; method for preparation of biodegradable aliphatic polyesters by  
using  
calcium organic compds. as ring opening **polymerization** catalysts)  
IT Polymers, preparation

RL: BUU (Biological use, unclassified); IMF (Industrial manufacture); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
 (biodegradable, 2; method for preparation of biodegradable aliphatic polyesters  
 by using calcium organic compds. as ring opening **polymerization** catalysts)

IT Polyoxyalkylenes, preparation  
 RL: BUU (Biological use, unclassified); IMF (Industrial manufacture); PRP (Properties); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
 (polyester-, block; method for preparation of biodegradable aliphatic polyesters by using calcium organic compds. as ring opening **polymn** . catalysts)

IT Polyoxyalkylenes, preparation  
 RL: BUU (Biological use, unclassified); IMF (Industrial manufacture); PRP (Properties); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
 (polyester-; method for preparation of biodegradable aliphatic polyesters by using calcium organic compds. as ring opening **polymerization** catalysts)

IT Polyesters, preparation  
 RL: BUU (Biological use, unclassified); IMF (Industrial manufacture); PRP (Properties); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
 (polyoxyalkylene-, block; method for preparation of biodegradable aliphatic polyesters by using calcium organic compds. as ring opening **polymn** . catalysts)

IT Polyesters, preparation  
 RL: BUU (Biological use, unclassified); IMF (Industrial manufacture); PRP (Properties); BIOL (Biological study); **PREP (Preparation)**; USES (Uses)  
 (polyoxyalkylene-; method for preparation of biodegradable aliphatic polyesters  
 by using calcium organic compds. as ring opening **polymerization** catalysts)

IT **Polymerization**  
**Polymerization** catalysts  
 (ring-opening; method for preparation of biodegradable aliphatic polyesters  
 by using calcium organic compds. as ring opening **polymerization** catalysts)

IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
 Poly[oxy(1-oxo-1,6-hexanediyl)] 25639-73-0P,  $\epsilon$ -Caprolactone-  
 propylene oxide copolymer 26161-42-2P 30174-06-2P,  
 $\epsilon$ -Caprolactone-ethylene oxide copolymer 33135-50-1P,  
 Poly(L-lactide) 65408-67-5P,  $\epsilon$ -Caprolactone-L-lactide  
 copolymer 107596-21-4P,  $\epsilon$ -Caprolactone-ethylene oxide block  
 copolymer 111821-20-6P,  $\epsilon$ -Caprolactone-L-lactide block  
 copolymer 114789-27-4P,  $\epsilon$ -Caprolactone-propylene oxide block  
 copolymer 149479-29-8P, Ethylene oxide-L-lactide block copolymer  
 171370-11-9P 389131-02-6P  
 RL: BUU (Biological use, unclassified); IMF (Industrial  
 manufacture); PRP (Properties); BIOL (Biological study); **PREP**  
 (Preparation); USES (Uses)

(method for preparation of biodegradable aliphatic polyesters by using calcium

organic compds. as ring opening **polymerization** catalysts)

IT 7440-70-2D, Calcium, compds.

RL: CAT (Catalyst use); USES (Uses)

(method for preparation of biodegradable aliphatic polyesters by using calcium

organic compds. as ring opening **polymerization** catalysts)

L32 ANSWER 19 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2002:230640 CAPLUS

DOCUMENT NUMBER: 137:6527

TITLE: Ring opening **polymerization** of lactides  
using nucleophilic organic catalysts

AUTHOR(S): Connor, Eric F.; Nyce, Gregory; Moeck, Andreas; Myers, Matthew; Nederberg, Fredrick; Hedrick, James L.

CORPORATE SOURCE: IBM Almaden Research, San Jose, CA, 95120, USA

SOURCE: Polymer Preprints (American Chemical Society, Division of Polymer Chemistry) (2002), 43(1), 647

CODEN: ACPPAY; ISSN: 0032-3934

PUBLISHER: American Chemical Society, Division of Polymer Chemistry

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB The living ring-opening **polymerization** of **cyclic esters** is described using nucleophilic organic catalysts, including tertiary amines, phosphines and N-heterocyclic carbenes. In particular N-heterocyclic carbenes, a relatively unexplored organic catalyst, was found to be very reactive for **polymerization** with respect to other catalysts surveyed.

IT 26680-10-4P, Polylactide

RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); PREP (Preparation); PROC (Process)

(ring opening **polymerization** of lactides using nucleophilic organic catalysts)

RN 26680-10-4 CAPLUS

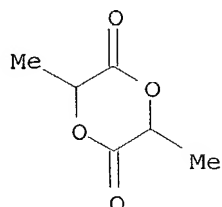
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4





- CC 35-7 (Chemistry of Synthetic High Polymers)
- ST ring opening **polymer** lactide nucleophilic org catalyst  
heterocyclic carbene; polyester synthesis **cyclic ester**  
ring opening heterocyclic carbene catalyst
- IT Carbenes (methylene derivatives)  
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(alkylidene, heterocyclic; ring opening **polymerization** of lactides using nucleophilic organic catalysts)
- IT Polyesters, preparation  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (Synthetic preparation); **PREP (Preparation)**; PROC (Process)  
(ring opening **polymerization** of lactides using nucleophilic organic catalysts)
- IT **Polymerization catalysts**  
(ring-opening; ring opening **polymerization** of lactides using nucleophilic organic catalysts)
- IT 141556-42-5  
RL: CAT (Catalyst use); CPS (Chemical process); PEP (Physical, engineering or chemical process); PROC (Process); USES (Uses)  
(ring opening **polymerization** of lactides using nucleophilic organic catalysts)
- IT 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] **26680-10-4P**, Polylactide  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical process); SPN (**Synthetic preparation**); **PREP (Preparation)**; PROC (Process)  
(ring opening **polymerization** of lactides using nucleophilic organic catalysts)

REFERENCE COUNT: 11 THERE ARE 11 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 20 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2002:221299 CAPLUS  
DOCUMENT NUMBER: 136:386448  
TITLE: Mechanistic Comparison of **Cyclic Ester Polymerizations** by Novel Iron(III)-Alkoxide Complexes: Single vs Multiple Site Catalysis  
AUTHOR(S): O'Keefe, Brendan J.; Breyfogle, Laurie E.; Hillmyer, Marc A.; Tolman, William B.

CORPORATE SOURCE: Department of Chemistry, University of Minnesota,  
Minneapolis, MN, 55455, USA

SOURCE: Journal of the American Chemical Society (2002),  
124(16), 4384-4393  
CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The complexes  $\text{Fe}_2(\text{OCHPh}_2)_6$  and  $\text{L}_2\text{FeOR}$  ( $\text{R} = \text{Et}$  or  $\text{CHPh}_2$ ,  $\text{L} = \text{N,N}'\text{-bis(trimethylsilyl)benzamidinate}$ ) were structurally characterized, and comparative studies of the behavior of those compds. comprising the same alkoxide ( $\text{Ph}_2\text{HCO-}$ ) in **polymns.** of  $\epsilon$ -caprolactone (CL) and D,L-lactide (LA) were performed. Both  $\text{Fe}_2(\text{OCHPh}_2)_6$  and  $\text{L}_2\text{FeOCHPh}_2$  are effective **polymerization** catalysts, as reflected by mol. weight control, polydispersities, and end group anal., but the diiron complex generally exhibits greater **polymerization** control, particularly for CL. Kinetic investigations of the **polymerization** of CL revealed the same first-order dependence on [CL] for both catalysts, but different orders in [catalyst] that signified a distinct contrast in mechanism. Anal. that invoked the presence of a termination-causing impurity at low concentration yielded a first-order dependence on  $[\text{Fe}_2(\text{OCHPh}_2)_6]$ , but the order in  $[\text{L}_2\text{FeOCHPh}_2]$  was found to be one-half. This fractional dependence was interpreted by using a model of active chain aggregation. Comparison of the derived propagation rate consts. ( $k_{\text{prop}}$ ) revealed a .apprx.50-fold greater value for the diiron complex compared to the single site mononuclear compound. Implications of these findings for understanding **cyclic ester polymerization** mechanisms and catalyst design are discussed.

IT 26680-10-4P, D,L-Lactide homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(preparation and characterization of novel iron(III)-alkoxide complex catalysts for **cyclic ester polymerization**)

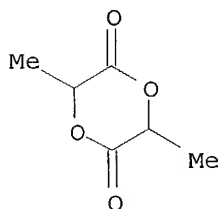
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67, 78

- ST iron alkoxide complex **cyclic ester polymn**  
catalyst; caprolactone **polymn** kinetics iron alkoxide complex  
catalyst; lactide **polymn** kinetics iron alkoxide complex catalyst
- IT Bond angle  
Bond length  
Molecular weight  
Polydispersity  
**Polymerization**  
**Polymerization** catalysts  
**Polymerization** kinetics  
(preparation and characterization of novel iron(III)-alkoxide complex  
catalysts for **cyclic ester polymerization**)
- IT Polyesters, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(**Preparation**)  
(preparation and characterization of novel iron(III)-alkoxide complex  
catalysts for **cyclic ester polymerization**)
- IT 137931-06-7P 428500-17-8P  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(intermediate; preparation and characterization of novel iron(III)-alkoxide  
complex catalysts for **cyclic ester polymn**  
.)
- IT 428517-93-5P 428517-94-6P 428517-95-7P  
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation);  
**PREP** (**Preparation**); USES (Uses)  
(preparation and characterization of novel iron(III)-alkoxide complex  
catalysts for **cyclic ester polymerization**)
- IT 502-44-3,  $\epsilon$ -Caprolactone  
RL: CPS (Chemical process); PEP (Physical, engineering or chemical  
process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(preparation and characterization of novel iron(III)-alkoxide complex  
catalysts for **cyclic ester polymerization**)
- IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
Poly( $\epsilon$ -caprolactone), sru 26023-30-3P, D,L-Lactide homopolymer,  
sru 26680-10-4P, D,L-Lactide homopolymer  
RL: PRP (Properties); SPN (**Synthetic preparation**); **PREP**  
(**Preparation**)  
(preparation and characterization of novel iron(III)-alkoxide complex  
catalysts for **cyclic ester polymerization**)
- IT 20398-06-5, Thallium ethoxide 148422-47-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material; preparation and characterization of novel  
iron(III)-alkoxide complex catalysts for **cyclic ester**  
**polymerization**)

REFERENCE COUNT: 52 THERE ARE 52 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 21 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2002:54520 CAPLUS  
DOCUMENT NUMBER: 136:247960

TITLE: First Example of N-Heterocyclic Carbenes as Catalysts for Living **Polymerization**: Organocatalytic Ring-Opening **Polymerization** of **Cyclic Esters**

AUTHOR(S): Connor, Eric F.; Nyce, Gregory W.; Myers, Matthew; Moeck, Andreas; Hedrick, James L.

CORPORATE SOURCE: IBM Almaden Research, San Jose, CA, 95120, USA  
SOURCE: Journal of the American Chemical Society (2002), 124(6), 914-915

CODEN: JACSAT; ISSN: 0002-7863

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A novel metal-free, organocatalytic approach to living **polymerization** is presented. N-heterocyclic carbenes were employed as nucleophilic catalysts for the ring-opening **polymerization** (ROP) of **cyclic ester** monomers. The catalysts is used in combination with an initiator, such as an alc., which generates an  $\alpha$ -end group bearing the ester from the initiating alc. upon ring-opening and a hydroxyl functional  $\omega$ -chain end that propagates the chain. This class of catalyst proved to be more reactive than tertiary amine and phosphine nucleophiles, producing narrowly dispersed polymers of predictable mol. wts. at room temperature in 1-2 h. Catalysis with respect to both initiating alc. and monomer was observed. Control of the  $\alpha$  and  $\omega$  end-groups was demonstrated with a pyrene-labeled initiator, allowing the preparation of well-defined macromol. architectures. Analogous to the ROP of **cyclic esters** using biocatalysts, the **polymerization** pathway using the N-heterocyclic carbenes is believed to ensue through a monomer-activated mechanism.

IT 33135-50-1P, Poly(L-lactide)

RL: SPN (Synthetic preparation); PREP (Preparation)  
(living ring-opening **polymerization** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

RN 33135-50-1 CAPLUS

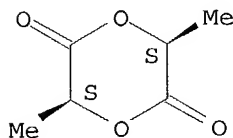
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-3 (Chemistry of Synthetic High Polymers)

ST living ring opening cationic **polymn cyclic ester** carbene catalyst; lactide caprolactone butyrolactone living **polymn** bistrimethylphenylimidazolylidene

IT **Polymerization** catalysts  
(cationic, ring-opening, living; living ring-opening **polymerization** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

IT Polyesters, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(living ring-opening **polymerization** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

IT Polyoxyalkylenes, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**polymerization** initiator, 6-arm; living ring-opening **polymn** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

IT 141556-42-5  
RL: CAT (Catalyst use); USES (Uses)  
(living ring-opening **polymerization** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P, Poly[oxy(1-oxo-1,6-hexanediyl)] 26161-42-2P 26744-04-7P, Poly( $\beta$ -butyrolactone), SRU 33135-50-1P, Poly(L-lactide) 36486-76-7P, Poly( $\beta$ -butyrolactone)  
RL: **SPN (Synthetic preparation); PREP (Preparation)**  
(living ring-opening **polymerization** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

IT 25322-69-4, Polypropylene glycol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**polymerization** initiator, 6-arm; living ring-opening **polymn** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

IT 100-51-6, Benzyl alcohol, reactions 67000-89-9, 1-Pyrenebutanol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(**polymerization** initiator; living ring-opening **polymerization** of lactides and lactones with 1,3-bis(2,4,6-trimethylphenyl)imidazol-2-ylidene catalyst)

REFERENCE COUNT: 37 THERE ARE 37 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 22 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:851277 CAPLUS

DOCUMENT NUMBER: 136:6523

TITLE: Polymers based on heterocyclic monomers, their production and use of stannylenes and germylenes as catalysts therefor

INVENTOR(S): Dumitrescu, Anca; Gornitzka, Heinz; Martin-Vaca, Blanca; Bourissou, Didier; Bertrand, Guy; Cazaux, Jean-Bernard

PATENT ASSIGNEE(S): Societe de Conseils de Recherches et d'Applications Scientifiques (S.C.R.A.S.), Fr.; Centre National de la Recherche Scientifique (C.N.R.S.)

SOURCE: PCT Int. Appl., 20 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001088014	A1	20011122	WO 2001-FR1405	20010510
W: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG				
EP 1290062	A1	20030312	EP 2001-934071	20010510
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO, MK, CY, AL, TR				
US 2003153717	A1	20030814	US 2002-275332	20021107
NO 2002005410	A	20021112	NO 2002-5410	20021112
PRIORITY APPLN. INFO.:			EP 2000-401309	A 20000515
			WO 2001-FR1405	W 20010510

OTHER SOURCE(S): MARPAT 136:6523

AB The invention concerns the use of stannylenes and germylenes ML<sub>1</sub>L<sub>2</sub> (M = Sn, Ge; L<sub>1</sub>, L<sub>2</sub> = organic groups containing Si, N, P, O, and/or S; M, L<sub>1</sub>, and/or L<sub>2</sub> may be linked in a cyclic manner) as catalysts for the ring-opening **polymerization** of cyclic ethers such as epoxides and/or **cyclic esters** of lactic or glycolic acid. The catalysts are suitable for production of random or sequenced copolymers. Examples of copolymn. of D,L-lactide with glycolide using [(Me<sub>3</sub>Si)<sub>2</sub>N]<sub>2</sub>Sn and [[(Me<sub>3</sub>Si)<sub>2</sub>N]Sn(OBu-tert)]<sub>2</sub> were given.

IT **107131-72-6P**, D,L-Lactide-glycolide block copolymer  
 RL: **IMF (Industrial manufacture); PREP (Preparation)**  
 (stannylene catalyst for production of)

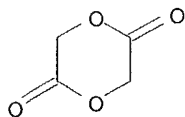
RN 107131-72-6 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione, block (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

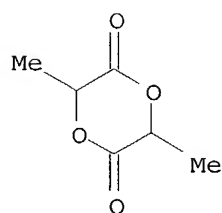
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



IT 26780-50-7P, D,L-Lactide-glycolide copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)  
(stannylene catalysts for production of)

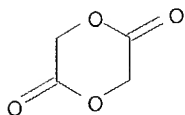
RN 26780-50-7 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione  
(9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

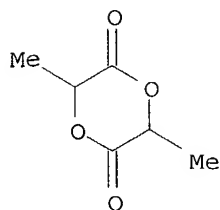
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



IC ICM C08G065-26  
 ICS C08G063-82; C08G065-12; B01J031-12  
 CC 35-3 (Chemistry of Synthetic High Polymers)  
 ST stannylene catalyst **polymn** glycolide lactide; germylene catalyst  
**polymn** epoxide **cyclic ester**  
 IT Polyesters, preparation  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
 (dilactone-based; stannylene catalysts for production of)  
 IT **Polymerization** catalysts  
 (ring-opening, stannylene and germylene; for copolymn. of lactide with  
 glycolide)  
 IT Polyoxyalkylenes, preparation  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
 (stannylene and germylene catalysts for production of)  
 IT 55147-78-9 123148-32-3  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalyst for copolymn. of lactide with glycolide)  
 IT **107131-72-6P**, D,L-Lactide-glycolide block copolymer  
 RL: **IMF (Industrial manufacture); PREP (Preparation)**  
 (stannylene catalyst for production of)  
 IT **26780-50-7P**, D,L-Lactide-glycolide copolymer  
 RL: **IMF (Industrial manufacture); PREP (Preparation)**  
 (stannylene catalysts for production of)  
 REFERENCE COUNT: 6 THERE ARE 6 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 23 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 2001:541448 CAPLUS  
 DOCUMENT NUMBER: 135:331685  
 TITLE: **Polymerization** of lactide and related  
**cyclic esters** by discrete metal  
 complexes  
 AUTHOR(S): O'Keefe, Brendan J.; Hillmyer, Marc A.; Tolman,  
 William B.  
 CORPORATE SOURCE: Department of Chemistry, University of Minnesota,  
 Minneapolis, MN, 55455-0431, USA  
 SOURCE: Journal of the Chemical Society, Dalton Transactions  
 (2001), (15), 2215-2224  
 CODEN: JCSDA; ISSN: 1472-7773  
 PUBLISHER: Royal Society of Chemistry  
 DOCUMENT TYPE: Journal; General Review  
 LANGUAGE: English



AB A review with refs. This perspective highlights recent research on the preparation of polyesters by the ring-opening **polymerization** of **cyclic esters** employing well-characterized metal complexes. Particular focus is placed on the preparation of polylactide because of environmental advantages: it is biodegradable and its feedstock, lactide, is a renewable resource. A recurring theme is the correlation of precatalyst structure, often by X-ray crystallog., with **polymerization** activity and selectivity. Through this systematic approach to the deconvolution of catalyst structure/reactivity relationships, improved mechanistic understanding has been attained and key design criteria required for the development of new catalysts that exert control over the mol. parameters of polyesters and related copolymers have been revealed.

IT 26680-10-4P, Polylactide

RL: SPN (Synthetic preparation); PREP (Preparation)  
(polymerization of lactide and related **cyclic esters** by discrete metal complexes)

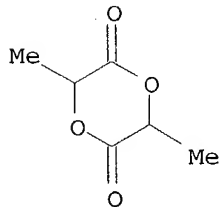
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-0 (Chemistry of Synthetic High Polymers)

ST review lactide **polymn** catalyst structure; metal complex catalyst **polymn** lactide review

IT Molecular structure-property relationship  
(catalyst activity; **polymerization** of lactide and related **cyclic esters** by discrete metal complexes)

IT Rare earth complexes

RL: CAT (Catalyst use); USES (Uses)  
(polymerization of lactide and related **cyclic esters** by discrete metal complexes)

IT Polyesters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)  
(polymerization of lactide and related **cyclic esters** by discrete metal complexes)

IT **Polymerization** catalysts

(ring-opening; **polymerization** of lactide and related **cyclic esters** by discrete metal complexes)

IT 7429-90-5D, Aluminum, complexes, uses 7439-89-6D, Iron, complexes, uses  
 7439-95-4D, Magnesium, complexes, uses 7440-31-5D, Tin, complexes, uses  
 7440-32-6D, Titanium, complexes, uses 7440-65-5D, Yttrium, complexes,  
 uses 7440-66-6D, Zinc, complexes, uses  
 RL: CAT (Catalyst use); USES (Uses)

(polymerization of lactide and related cyclic  
 esters by discrete metal complexes)

IT 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P  
 , Polylactide

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (polymerization of lactide and related cyclic  
 esters by discrete metal complexes)

REFERENCE COUNT: 55 THERE ARE 55 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 24 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:435157 CAPLUS

DOCUMENT NUMBER: 135:46664

TITLE: Process for the preparation of polymers of dimeric  
 cyclic esters

INVENTOR(S): Baker, Gregory L.; Smith, Milton R., III

PATENT ASSIGNEE(S): Michigan State University, USA

SOURCE: PCT Int. Appl., 105 pp.

CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 2001042333	A2	20010614	WO 2000-US33869	20001213
WO 2001042333	A3	20011206		
W:	AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR, BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG			
US 2001044514	A1	20011122	US 2000-736991	20001213
US 6469133	B2	20021022		

PRIORITY APPLN. INFO.: US 1999-170425P P 19991213

AB The present invention provides a process for the direct synthesis of high melting polymers made from dimeric **cyclic esters**. In particular, the present invention provides a process for synthesis of polylactic acid (PLA) from racemic materials such as racemic lactide and polymandelide from mandelide. The process further provides racemic metal organic ligand catalysts such as racemic salbinap that catalyzes the **polymerization of racemic dimeric cyclic ester**

monomers to a polylactide stereocomplex. Polymandelide and mixed dimeric **cyclic esters** are also prepared in the presence of low amts. of water.

IT 26680-10-4P, Lactide homopolymer 33135-50-1P, L-Lactide homopolymer 344425-21-4P 344425-26-9P 344425-27-0P 344425-28-1P

RL: IMF (Industrial manufacture); PREP (Preparation)  
(process for the preparation of polymers of dimeric **cyclic esters**)

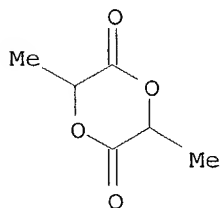
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



RN 33135-50-1 CAPLUS

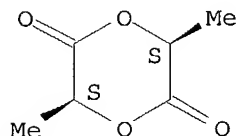
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



RN 344425-21-4 CAPLUS

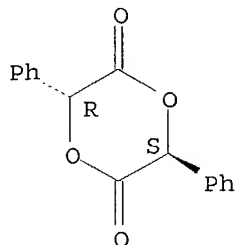
CN 1,4-Dioxane-2,5-dione, 3,6-diphenyl-, (3R,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 344425-20-3

CMF C16 H12 O4

Absolute stereochemistry.



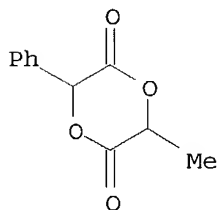
RN 344425-26-9 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3-methyl-6-phenyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 344425-23-6

CMF C11 H10 O4



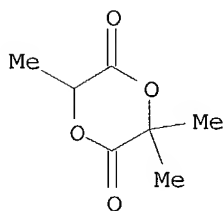
RN 344425-27-0 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,3,6-trimethyl-, homopolymer (9CI) (CA INDEX NAME)

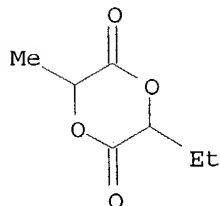
CM 1

CRN 249890-65-1

CMF C7 H10 O4



RN 344425-28-1 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3-ethyl-6-methyl-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 344425-22-5  
 CMF C7 H10 O4



IC ICM C08G063-08  
 ICS C08G063-82  
 CC 35-7 (Chemistry of Synthetic High Polymers)  
 ST **cyclic ester dimer polymn**; polylactic acid  
 manuf; polymandelide manuf  
 IT **Polymerization**  
     **Polymerization catalysts**  
     (process for the preparation of polymers of dimeric **cyclic esters**)  
 IT Polyesters, preparation  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
     (process for the preparation of polymers of dimeric **cyclic esters**)  
 IT 226927-22-6 261360-89-8  
 RL: CAT (Catalyst use); **USES (Uses)**  
     (process for the preparation of polymers of dimeric **cyclic esters**)  
 IT 26023-30-3P, Poly(lactide), sru 26161-42-2P, L-Lactide homopolymer, sru  
 26680-10-4P, Lactide homopolymer 28702-32-1P **33135-50-1P**  
 , L-Lactide homopolymer 49741-67-5P, Poly[oxy(1-oxo-2-phenyl-1,2-ethanediyl)] **344425-21-4P 344425-26-9P**  
**344425-27-0P 344425-28-1P**  
 RL: **IMF (Industrial manufacture); PREP (Preparation)**  
     (process for the preparation of polymers of dimeric **cyclic esters**)  
 IT 4026-18-0P, 2-Hydroxy-3-methylbutyric acid 21150-70-9P 249890-65-1P  
 344425-22-5P 344425-23-6P 344425-24-7P 344425-25-8P  
 RL: IMF (Industrial manufacture); **RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)**  
     (process for the preparation of polymers of dimeric **cyclic esters**)  
 IT 72-18-4, Valine, reactions 90-64-2, Mandelic acid 97-93-8, reactions  
 563-76-8, 2-Bromopropionyl bromide 594-61-6, 2-Hydroxyisobutyric acid

600-15-7, 2-Hydroxybutyric acid 611-71-2 17199-29-0, S-Mandelic acid  
140141-56-6

RL: RCT (Reactant); RACT (Reactant or reagent)  
(process for the preparation of polymers of dimeric **cyclic esters**)

L32 ANSWER 25 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:306259 CAPLUS

DOCUMENT NUMBER: 135:92897

TITLE: A Novel and Versatile Calcium-Based Initiator System  
for the Ring-Opening **Polymerization of Cyclic Esters**

AUTHOR(S): Zhong, Zhiyuan; Dijkstra, Pieter J.; Birg, Christin;  
Westerhausen, Matthias; Feijen, Jan

CORPORATE SOURCE: Department of Chemical Technology and Institute for  
Biomedical Technology, University of Twente, Enschede,  
7500 AE, Neth.

SOURCE: Macromolecules (2001), 34(12), 3863-3868

CODEN: MAMOBX; ISSN: 0024-9297

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB An efficient calcium alkoxide initiating system was developed, which is  
generated in situ from bis(tetrahydrofuran)calcium-  
bis[bis(trimethylsilyl)amide]  $[Ca[N(SiMe_3)_2]_2(THF)_2]$  and an alc., for the  
ring-opening **polymerization of cyclic esters**. The  
solution **polymerization** in THF using mild conditions follows a living  
mechanism, yielding polyesters of controlled mol. weight and tailored  
macromol. architecture. The **polymns.** initiated with the  
2-propanol- $Ca[N(SiMe_3)_2]_2(THF)_2$  system are first-order in monomer with no  
induction period. At high 2-propanol/ $Ca[N(SiMe_3)_2]_2(THF)_2$  ratios,  
complete conversion of 2-propanol occurs due to fast and reversible  
transfer between dormant and active species.

IT 33135-50-1P, Poly(L-lactide) 111821-20-6P,  
L-Lactide-ε-caprolactone block copolymer 131151-09-2P,  
Poly(ethylene glycol)-L-lactide block copolymer

RL: SPN (**Synthetic preparation**); PREP (**Preparation**)  
(calcium-trimethylsilylamido-THF initiator in ring-opening  
**polymerization of cyclic esters**)

RN 33135-50-1 CAPLUS

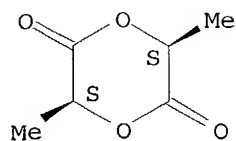
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



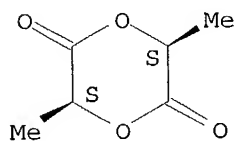
RN 111821-20-6 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone,  
 block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

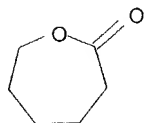
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



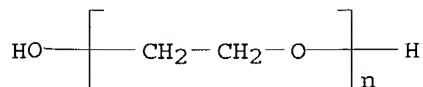
RN 131151-09-2 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
 $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl), block (9CI) (CA  
 INDEX NAME)

CM 1

CRN 25322-68-3

CMF (C2 H4 O)<sub>n</sub> H2 O

CCI PMS

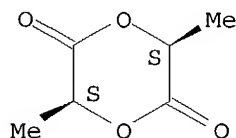


CM 2

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67

ST calcium alkoxide initiator in situ prepn; THF calcium trimethylsilylimide precursor initiator **polymn**; ring opening **polymn** **cyclic ester** calcium alkoxide initiator

IT Reactivity ratio in **polymerization**  
(calcium-trimethylsilylamido-THF initiator in ring-opening **polymerization of cyclic esters**)

IT Polyesters, preparation  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(calcium-trimethylsilylamido-THF initiator in ring-opening **polymerization of cyclic esters**)

IT **Polymerization**  
**Polymerization catalysts**  
**Polymerization kinetics**  
(ring-opening; calcium-trimethylsilylamido-THF initiator in ring-opening **polymerization of cyclic esters**)

IT 67-63-0, 2-Propanol, uses 133644-59-4, Bis(bis(trimethylsilyl)amido)bis(tetrahydrofuran)calcium  
RL: CAT (Catalyst use); USES (Uses)  
(alkoxide initiator precursor; calcium-trimethylsilylamido-THF initiator in ring-opening **polymerization of cyclic esters**)

IT 502-44-3,  $\epsilon$ -Caprolactone  
RL: PEP (Physical, engineering or chemical process); RCT (Reactant); PROC (Process); RACT (Reactant or reagent)  
(calcium-trimethylsilylamido-THF initiator in ring-opening **polymerization of cyclic esters**)

IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
Poly[oxy(1-oxo-1,6-hexanediyl)] 26161-42-2P 33135-50-1P,  
Poly(L-lactide) 111821-20-6P, L-Lactide- $\epsilon$ -caprolactone



block copolymer 131151-09-2P, Poly(ethylene glycol)-L-lactide  
block copolymer

RL: SPN (Synthetic preparation); PREP (Preparation)  
(calcium-trimethylsilylamido-THF initiator in ring-opening  
polymerization of cyclic esters)

REFERENCE COUNT: 43 THERE ARE 43 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 26 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:221201 CAPLUS

DOCUMENT NUMBER: 135:5946

TITLE: **Polymerization** of lactones and D,L-lactide  
initiated by lanthanum isopropoxide

AUTHOR(S): Save, M.; Soum, A.

CORPORATE SOURCE: Laboratoire de Chimie des Polymeres Organiques, UMR  
5629, E.N.S.C.P.B., Talence, 33402, Fr.

SOURCE: Polymer Preprints (American Chemical Society, Division  
of Polymer Chemistry) (2001), 42(1), 655-656  
CODEN: ACPPAY; ISSN: 0032-3934

PUBLISHER: American Chemical Society, Division of Polymer  
Chemistry

DOCUMENT TYPE: Journal; (computer optical disk)

LANGUAGE: English

AB Controlled **polymerization** of several **cyclic esters**  
is possible using the highly reactive lanthanum isopropoxide initiator.  
Kinetic, viscosimetry and <sup>13</sup>C NMR studies have been carried out in order  
to better understand the mechanism of **polymerization**

IT 26680-10-4P, Lactide homopolymer

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
(Preparation)

(Polymerization of lactones and D,L-lactide initiated by lanthanum  
isopropoxide)

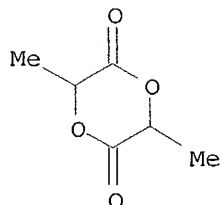
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-7 (Chemistry of Synthetic High Polymers)

ST lactones lactide ring opening **polymn** lanthanum isopropoxide

catalyst kinetics

IT Polyesters, reactions  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (lactide; **polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

IT Polyesters, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
 (**Preparation**)  
 (lactone-based; **polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

IT **Polymerization** catalysts  
 (ring-opening; **Polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

IT **Polymerization** kinetics  
 (ring-opening; **polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

IT 95-96-5, Lactide  
 RL: PRP (Properties); RCT (Reactant); RACT (Reactant or reagent)  
 (**Polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  $\epsilon$ -Caprolactone homopolymer, SRU 26023-30-3P, Lactide homopolymer, SRU 26354-94-9P,  $\delta$ -Valerolactone homopolymer 26499-05-8P,  $\delta$ -Valerolactone homopolymer, SRU **26680-10-4P**, Lactide homopolymer 26744-04-7P,  $\beta$ -Butyrolactone homopolymer, SRU 34853-80-0P 36486-76-7P,  $\beta$ -Butyrolactone homopolymer 342420-91-1P  
 RL: PRP (Properties); SPN (**Synthetic preparation**); **PREP**  
 (**Preparation**)  
 (**Polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

IT 19446-52-7, Lanthanum isopropoxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (**polymerization** catalyst, ring-opening; **polymerization** of lactones and D,L-lactide initiated by lanthanum isopropoxide)

REFERENCE COUNT: 12 THERE ARE 12 CITED REFERENCES AVAILABLE FOR THIS RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 27 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2001:26799 CAPLUS

DOCUMENT NUMBER: 134:237877

TITLE: Lactide **polymerization** activity of alkoxide, phenoxide, and amide derivatives of yttrium(III) arylamidinates

AUTHOR(S): Aubrecht, Katherine B.; Chang, Karen; Hillmyer, Marc A.; Tolman, William B.

CORPORATE SOURCE: Department of Chemistry, University of Minnesota, Minneapolis, MN, 55455, USA

SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry (2000), Volume Date 2001, 39(2), 284-293  
 CODEN: JPACEC; ISSN: 0887-624X

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB In quest of new, single-site catalysts for **cyclic ester polymns.**, a series of mononuclear yttrium(III) complexes of N,N'-bis(trimethylsilyl)benzamidine ([LTMS]-) and hindered N,N'-bis-(2,6-dialkylaryl)toluamidinates ([LEt]-, aryl = Et<sub>2</sub>C<sub>6</sub>H<sub>3</sub>, and [LiPr]-, aryl = iPr<sub>2</sub>C<sub>6</sub>H<sub>3</sub>) were synthesized and characterized by X-ray diffraction: L<sub>2</sub>TMSY( $\mu$ -Cl)<sub>2</sub>Li(TMEDA) (1), L<sub>2</sub>TMSY(OC<sub>6</sub>H<sub>2</sub>tBu<sub>2</sub>Me) (2), L<sub>2</sub>TMSY(OC<sub>6</sub>H<sub>3</sub>Me<sub>2</sub>)<sub>2</sub>Li(THF)<sub>4</sub> (3), L<sub>2</sub>TMSY( $\mu$ -OtBu)<sub>2</sub>Li(THF) (4), LiPrY[N(SiMe<sub>2</sub>H)<sub>2</sub>]<sub>2</sub>(THF) (5), L<sub>2</sub>EtY(THF)(Cl)( $\mu$ -Cl)Li(THF)<sub>3</sub> (6), and L<sub>2</sub>EtY[N(SiMe<sub>2</sub>H)<sub>2</sub>] (7). Coordination nos. ranging from five to seven were observed, and they appeared to be controlled by the steric bulk of the supporting amidinate and alkoxide, phenoxide, or amide coligands. Complexes 2-5 and 7 are active catalysts for the **polymerization** of D,L-lactide (e.g., with 2 and added benzyl alc., 1000 equiv of D,L-lactide were **polymerized** at room temperature in less than 1 h, with polydispersities less than 1.5). The neutral complexes 2, 5, and 7 were more effective than the anionic complexes 3 and 4. In addition, the presence of the more hindered amidinate ligands [LEt]- and [LiPr]- on yttrium-amides slowed the **polymns.** (7 < 5 < Y[N(SiMe<sub>2</sub>H)<sub>2</sub>]<sub>3</sub>).

IT 26680-10-4P, D,L-Lactide homopolymer

RL: SPN (Synthetic preparation); PREP (Preparation)

(lactide **polymerization** activity of alkoxide, phenoxide, and amide derivs. of yttrium(III) arylamidinates)

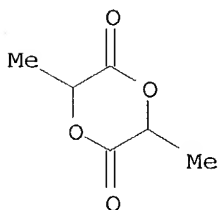
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-3 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 75, 78

ST yttrium amidinate single site catalyst lactide ring opening **polymn**  
; crystal structure yttrium amidinate complex **polymn** catalyst

IT Crystal structure

Molecular structure

(lactide **polymerization** activity of alkoxide, phenoxide, and amide derivs. of yttrium(III) arylamidinates)

IT Polyesters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(lactide **polymerization** activity of alkoxide, phenoxide, and amide

derivs. of yttrium(III) arylamidinates)

IT **Polymerization** catalysts  
(ring-opening, single-site; lactide **polymerization** activity of  
alkoxide, phenoxide, and amide derivs. of yttrium(III) arylamidinates)

IT 330442-66-5P 330442-73-4P  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(catalyst precursor; lactide **polymerization** activity of alkoxide,  
phenoxide, and amide derivs. of yttrium(III) arylamidinates)

IT 10361-92-9, Yttrium trichloride 148422-47-3  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(catalyst synthesis; lactide **polymerization** activity of alkoxide,  
phenoxide, and amide derivs. of yttrium(III) arylamidinates)

IT 176697-09-9P 330442-68-7P 330442-69-8P 330442-70-1P 330442-75-6P  
RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation);  
**PREP (Preparation)**; USES (Uses)  
(lactide **polymerization** activity of alkoxide, phenoxide, and amide  
derivs. of yttrium(III) arylamidinates)

IT 865-48-5, tert-Butanol, sodium salt 24560-29-0 42031-71-0 73612-22-3  
160952-40-9 330442-71-2  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(lactide **polymerization** activity of alkoxide, phenoxide, and amide  
derivs. of yttrium(III) arylamidinates)

IT 330442-74-5P  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(lactide **polymerization** activity of alkoxide, phenoxide, and amide  
derivs. of yttrium(III) arylamidinates)

IT 26023-30-3P, D,L-Lactide homopolymer, SRU 26680-10-4P,  
D,L-Lactide homopolymer  
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**  
(lactide **polymerization** activity of alkoxide, phenoxide, and amide  
derivs. of yttrium(III) arylamidinates)

IT 117696-82-9P 200116-58-1P  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(ligand synthesis, intermediate; lactide **polymerization** activity of  
alkoxide, phenoxide, and amide derivs. of yttrium(III) arylamidinates)

IT 579-66-8, 2,6-Diethylaniline 874-60-2, p-Toluoyl chloride  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(ligand synthesis; lactide **polymerization** activity of alkoxide,  
phenoxide, and amide derivs. of yttrium(III) arylamidinates)

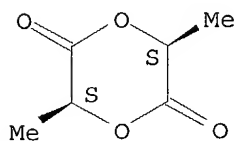
IT 330442-72-3P  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
(**Preparation**); RACT (Reactant or reagent)  
(ligand; lactide **polymerization** activity of alkoxide, phenoxide, and  
amide derivs. of yttrium(III) arylamidinates)

REFERENCE COUNT: 69 THERE ARE 69 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 28 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 2000:419430 CAPLUS

DOCUMENT NUMBER: 133:151029  
 TITLE: **Polymerizations** of  $\epsilon$ -caprolactone and L,L-dilactide initiated with stannous octoate and stannous butoxide - a comparison  
 AUTHOR(S): Duda, Andrzej; Penczek, Stanislaw; Kowalski, Adam; Libiszowski, Jan  
 CORPORATE SOURCE: Department of Polymer Chemistry, Center of Molecular and Macromolecular Studies, Polish Academy of Sciences, Lodz, 90-363, Pol.  
 SOURCE: Macromolecular Symposia (2000), 153(Recent Advances in Ring Opening (Metathesis) Polymerization), 41-53  
 CODEN: MSYMEC; ISSN: 1022-1360  
 PUBLISHER: Wiley-VCH Verlag GmbH  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB **Polymns.** of  $\epsilon$ -caprolactone (CL) and L,L-dilactide (LA) initiated with stannous octoate  $\text{Sn}(\text{O}(\text{O})\text{CCH}(\text{C}_4\text{H}_9)\text{C}_2\text{H}_5)_2$  ( $\text{Sn}(\text{Oct})_2$ ),  $\text{Sn}(\text{Oct})_2/\text{C}_4\text{H}_9\text{OH}$ , stannous butoxide ( $\text{Sn}(\text{OC}_4\text{H}_9)_2$ ), and  $\text{Sn}(\text{OC}_4\text{H}_9)_2/\text{C}_2\text{H}_5(\text{C}_4\text{H}_9)\text{CHC}(\text{O})\text{OH}$  were studied. It is shown, on the basis of the pertinent kinetic data and MALDI-TOF evidence, that **polymerization of cyclic esters** initiated by  $\text{Sn}(\text{Oct})_2$  in the presence of ROH as coinitiator proceeds on the tin(II) alkoxide (...-Sn-OR) active centers.  $\text{Sn}(\text{OC}_4\text{H}_9)_2$  initiator behaves as other covalent metal alkoxides, i.e.: initiation is fast and quant., every alkoxide group in  $\text{Sn}(\text{OC}_4\text{H}_9)_2$  starts growth of one macromol., and monomer addition proceeds with the acyl-oxygen bond scission. **Polymerization** in the LA/ $\text{Sn}(\text{OC}_4\text{H}_9)_2$  system is a living process and can be controlled in a wide range of molar masses, from  $M_n = 103$  to 106. Kinetic convergence of the **polymns.** initiated with  $\text{Sn}(\text{Oct})_2/\text{C}_4\text{H}_9\text{OH}$ , and  $\text{Sn}(\text{OC}_4\text{H}_9)_2/\text{C}_2\text{H}_5(\text{C}_4\text{H}_9)\text{CHC}(\text{O})\text{O H}$  points to an identity of growing species in both systems.  
 IT 33135-50-1P, L,-Dilactide homopolymer  
 RL: **SPN (Synthetic preparation); PREP (Preparation)** (**polymns.** of  $\epsilon$ -caprolactone and L,L-dilactide initiated with stannous octoate and stannous butoxide)  
 RN 33135-50-1 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 4511-42-6  
 CMF C6 H8 O4

Absolute stereochemistry.



CC 35-7 (Chemistry of Synthetic High Polymers)  
ST caprolactone dilactide **polymn** catalyst stannous octoate butoxide  
IT **Polymerization** catalysts  
(ring-opening; **polymns.** of  $\epsilon$ -caprolactone and  
L,L-dilactide initiated with stannous octoate and stannous butoxide)  
IT 71-36-3, n-Butanol, uses 149-57-5 301-10-0, Stannous octoate  
26306-46-7, Stannous butoxide  
RL: CAT (Catalyst use); USES (Uses)  
(**polymns.** of  $\epsilon$ -caprolactone and L,L-dilactide  
initiated with stannous octoate and stannous butoxide)  
IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 26161-42-2P, L,-Lactide  
homopolymer, sru 33135-50-1P, L,-Dilactide homopolymer  
RL: **SPN (Synthetic preparation); PREP (Preparation)**  
(**polymns.** of  $\epsilon$ -caprolactone and L,L-dilactide  
initiated with stannous octoate and stannous butoxide)  
REFERENCE COUNT: 20 THERE ARE 20 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 29 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:298716 CAPLUS

DOCUMENT NUMBER: 133:59184

TITLE: Controlled ring-opening **polymerization** of  
L-lactide and 1,5-Dioxepan-2-one forming a triblock  
copolymer

AUTHOR(S): Stridsberg, Kajsa; Albertsson, Ann-Christine

CORPORATE SOURCE: Department of Polymer Technology, Royal Institute of  
Technology, Stockholm, S-100 44, Swed.

SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry  
(2000), 38(10), 1774-1784  
CODEN: JPACEC; ISSN: 0887-624X

PUBLISHER: John Wiley & Sons, Inc.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Novel elastomeric A-B-A triblock copolymers were successfully synthesized  
in a new two-step process: controlled ring-opening **polymerization** of  
the **cyclic ether-ester** 1,5-dioxepan-2-one as the  
amorphous middle block (B-block) followed by addition and **polymerization**  
of the two semicryst. L-lactide blocks (A-block). A 1,1,6,6-tetrabutyl-  
1,6-distanna-2,5,7,10-tetraoxacyclodecane initiator system was utilized  
and the reaction was performed in chloroform at 60°C. A good  
control of the synthesis was obtained, resulting in well defined triblock  
copolymers. The mol. weight and chemical composition were easily adjusted by

the

monomer-to-initiator ratio. The triblock copolymers formed exhibited  
semicrystallinity up to a content of 1,5-dioxepan-2-one as high as 89% as  
determined by DSC. WAXS investigation of the triblock copolymers showed a  
crystal structure similar to that of the pure poly(L-lactide).

IT 276686-93-2P, 1,5-Dioxepan-2-one-L-lactide block copolymer

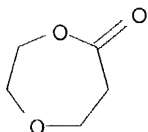
RL: PRP (Properties); **SPN (Synthetic preparation); PREP**  
(**Preparation**)

(triblock; ring-opening block **polymerization** of lactide with  
dioxepanone)

RN 276686-93-2 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
1,4-dioxepan-5-one, block (9CI) (CA INDEX NAME)

CM 1

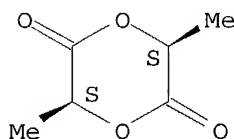
CRN 35438-57-4  
CMF C5 H8 O3



CM 2

CRN 4511-42-6  
CMF C6 H8 O4

Absolute stereochemistry.



CC 35-7 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 39  
ST dioxepanone lactide ring opening block **polymn**; polyether  
polyester block elastomer; stannane cyclic ether initiator block  
**polymn**  
IT **Polymerization** catalysts  
(block, ring-opening; for lactide with dioxepanone)  
IT **Polymerization**  
(block, ring-opening; of lactide with dioxepanone)  
IT Crystallinity  
Fusion enthalpy  
(of lactide-dioxepanone triblock copolymers)  
IT Polyethers, preparation  
Polyethers, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(**Preparation**)  
(polyester-, block, triblock; from ring-opening block **polymerization**  
of lactide with dioxepanone)  
IT Polyesters, preparation  
Polyesters, preparation

RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
**(Preparation)**  
 (polyether-, block, triblock; from ring-opening block **polymerization**  
 of lactide with dioxepanone)

IT **Polymerization** catalysts  
 (ring-opening, block; for lactide with dioxepanone)

IT **Polymerization**  
 (ring-opening, block; of lactide with dioxepanone)

IT 3590-59-8 5271-60-3, 1,1,6,6-Tetrabutyl-1,6-distanna-2,5,7,10-  
 tetraoxacyclodecane  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalysts for ring-opening block **polymerization** of lactide with  
 dioxepanone)

IT 7732-18-5, Water, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (effect on ring-opening block **polymerization** of lactide with  
 dioxepanone)

IT **276686-93-2P**, 1,5-Dioxepan-2-one-L-lactide block copolymer  
 RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
**(Preparation)**  
 (triblock; ring-opening block **polymerization** of lactide with  
 dioxepanone)

REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 30 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:290656 CAPLUS

DOCUMENT NUMBER: 132:308855

TITLE: Copolymers of  $\epsilon$ -caprolactone and  
**cyclic esters** of alpha-hydroxyacids  
 and polyurethanes derivable from these polymers

INVENTOR(S): Dutton, Amanda Jane; Derbyshire, Stewart; Wasson,  
 Robert Craig

PATENT ASSIGNEE(S): Solvay (Societe Anonyme), Belg.

SOURCE: Eur. Pat. Appl., 9 pp.  
 CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 997487	A1	20000503	EP 1998-308858	19981029
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, SI, LT, LV, FI, RO				
WO 2000026273	A1	20000511	WO 1999-EP8142	19991021
W: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW, AM,				



AZ, BY, KG, KZ, MD, RU, TJ, TM  
 RW: GH, GM, KE, LS, MW, SD, SL, SZ, TZ, UG, ZW, AT, BE, CH, CY, DE,  
 DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF,  
 CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG

PRIORITY APPLN. INFO.: EP 1998-308858 19981029

AB The copolymer having a viscosity <2000 cP is prepared by the **polymn**  
 . of 1.5 mol a lactone or its an aliphatic hydroxy acid and 1 mol a  
**cyclic dimeric ester** of  $\alpha$ -hydroxy acid or its  
 $\alpha$ -hydroxy acid, wherein the polymer can be reacted with an  
 isocyanate to form a polyurethane with good properties. Thus, a copolymer  
 which can be reacted with 4,4'-diisocyanatodiphenylmethane was prepared by  
 the reaction of  $\epsilon$ -caprolactone 668.5, L-lactide 286.48 and  
 1,4-butanediol 45.06 g for 120 min at 80° and then for 23.5 h at  
 180° in the presence of stannous octoate.

IT 265114-53-2P

RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)

(copolymers of  $\epsilon$ -caprolactone and **cyclic**  
**esters** of alpha-hydroxyacids and polyurethanes derivable from  
 these polymers)

RN 265114-53-2 CAPLUS

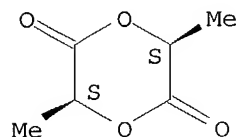
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
 1,4-butanediol, 1,1'-methylenebis[4-isocyanatobenzene] and 2-oxepanone  
 (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

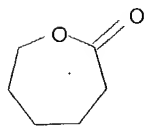
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



CM 3

CRN 110-63-4

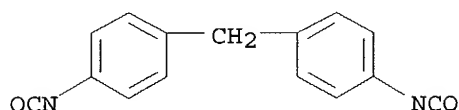
CMF C4 H10 O2

HO-(CH<sub>2</sub>)<sub>4</sub>-OH

CM 4

CRN 101-68-8

CMF C15 H10 N2 O2



IT 219926-38-2P

RL: RCT (Reactant); SPN (Synthetic preparation); PREP (Preparation); RACT (Reactant or reagent)

(copolymers of ε-caprolactone and cyclic esters of alpha-hydroxyacids and polyurethanes derivable from these polymers)

RN 219926-38-2 CAPLUS

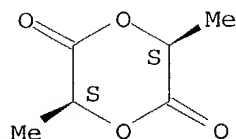
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 1,4-butanediol and 2-oxepanone (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

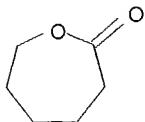
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



CM 3

CRN 110-63-4

CMF C4 H10 O2

HO—(CH<sub>2</sub>)<sub>4</sub>—OH

IC ICM C08G063-06  
ICS C08G063-08; C08G018-42  
CC 35-5 (Chemistry of Synthetic High Polymers)  
ST lactide caprolactone butanediol polyester; hydroxy acid polyurethane polyester; **cyclic ester** ring opening **polymn**  
IT Polyesters, preparation  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP** (**Preparation**); RACT (Reactant or reagent)  
(aliphatic; copolymers of  $\epsilon$ -caprolactone and **cyclic esters** of alpha-hydroxyacids and polyurethanes derivable from these polymers)  
IT Polyurethanes, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP** (**Preparation**)  
(polyester-; copolymers of  $\epsilon$ -caprolactone and **cyclic esters** of alpha-hydroxyacids and polyurethanes derivable from these polymers)  
IT **Polymerization**  
(ring-opening; copolymers of  $\epsilon$ -caprolactone and **cyclic esters** of alpha-hydroxyacids and polyurethanes derivable from these polymers)  
IT 265114-53-2P  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP** (**Preparation**)  
(copolymers of  $\epsilon$ -caprolactone and **cyclic esters** of alpha-hydroxyacids and polyurethanes derivable from these polymers)  
IT 219926-38-2P  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP** (**Preparation**); RACT (Reactant or reagent)  
(copolymers of  $\epsilon$ -caprolactone and **cyclic esters** of alpha-hydroxyacids and polyurethanes derivable from these polymers)  
REFERENCE COUNT: 7 THERE ARE 7 CITED REFERENCES AVAILABLE FOR THIS

RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 31 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 2000:107165 CAPLUS

DOCUMENT NUMBER: 132:237430

TITLE: Synthesis of aliphatic polyesters by controlled ring-opening **polymerization** of **cyclic esters**. Characterization, properties, transesterification reactions

AUTHOR(S): Spassky, Nicolas; Simic, Vesna; Hubert-Pfalzgraf, Liliane G.; Montaudo, Maurizio S.

CORPORATE SOURCE: Laboratoire Chimie Polymeres, Univ. P. et M. Curie, Paris, Fr.

SOURCE: Macromolecular Symposia (1999), 144(Degradability, Renewability and Recycling--Key Functions for Future Materials), 257-267

CODEN: MSYMEC; ISSN: 1022-1360

PUBLISHER: Wiley-VCH Verlag GmbH

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The **polymerization** of (D,L)-lactide at room temperature in solution using  $Y(OCH_2CH_2OiPr)_3$  and  $Ln_5(\mu-O)(OiPr)_3$  with  $Ln = La, Sm, Y, Yb$  as initiators was studied. According to kinetic data, a controlled type **polymerization** is observed for most of the systems.  $La \mu$ -oxoisopropoxide is the most reactive initiator, but leads to a substantial broadening of mol. weight distribution at high conversions. The nature of transesterification reactions was studied by SEC,  $^{13}C$  NMR, and MALDI-TOF MS techniques. For Sm and Y- $\mu$ -oxo initiators only limited intermol. ester exchange occurs, while with  $La \mu$ -oxo initiator and with  $Y(OCH_2CH_2OiPr)_3$  initiator, but after a long time of the **polymerization** reaction, both inter and intramol. transesterification occur with formation of cyclics.

IT 26680-10-4P, Poly(D,L-lactide)

RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)

(transesterification reactions in preparation of aliphatic polyesters by controlled ring-opening **polymerization** of **cyclic esters**)

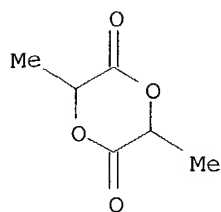
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-3 (Chemistry of Synthetic High Polymers)  
 ST lanthanide oxoisopropoxo complex transesterification **polymn**  
 catalyst lactide  
 IT Polyesters, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
**(Preparation)**  
 (aliphatic; transesterification reactions in preparation of aliphatic  
 polyesters  
 by controlled ring-opening **polymerization of cyclic**  
**esters**)  
 IT **Polymerization catalysts**  
 Transesterification catalysts  
 (transesterification reactions in preparation of aliphatic polyesters by  
 controlled ring-opening **polymerization of cyclic**  
**esters**)  
 IT 118458-20-1 128214-88-0 197579-01-4 197579-02-5 261903-40-6  
 RL: CAT (Catalyst use); USES (Uses)  
 (transesterification reactions in preparation of aliphatic polyesters by  
 controlled ring-opening **polymerization of cyclic**  
**esters**)  
 IT 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P  
 , Poly(D,L-lactide)  
 RL: PRP (Properties); **SPN (Synthetic preparation)**; **PREP**  
**(Preparation)**  
 (transesterification reactions in preparation of aliphatic polyesters by  
 controlled ring-opening **polymerization of cyclic**  
**esters**)  
 REFERENCE COUNT: 33 THERE ARE 33 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 32 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1999:559632 CAPLUS  
 DOCUMENT NUMBER: 131:258008  
 TITLE: Latexes and microspheres by ring-opening  
**polymerization. Polymerization of**  
**cyclic esters**  
 AUTHOR(S): Slomkowski, Stanislaw; Sosnowski, Stanislaw;  
 Gadzinowski, Mariusz  
 CORPORATE SOURCE: Center of Molecular and Macromolecular Studies, Polish  
 Academy of Sciences, Lodz, 90-363, Pol.  
 SOURCE: Colloids and Surfaces, A: Physicochemical and  
 Engineering Aspects (1999), 153(1-3), 111-118

CODEN: CPEAEH; ISSN: 0927-7757

PUBLISHER: Elsevier Science B.V.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Latexes and microspheres were synthesized by pseudoanionic **polymn** of lactides initiated with tin(II) 2-ethylhexanoate and pseudoanionic and anionic **polymerization** of  $\epsilon$ -caprolactone initiated with  $(\text{CH}_3\text{CH}_2)_2\text{AlOCH}_2\text{CH}_3$  and  $(\text{CH}_3)_3\text{SiONa}$ , resp. **Polymns.** were carried out in 1,4-dioxane/heptane mixts. with poly(dodecyl acrylate)-g-poly( $\epsilon$ -caprolactone) (poly(DA-CL)) added as a surfactant. Propagation was initiated in the homogeneous systems. When propagating macromols. reach their critical lengths ( $M_n \approx 1000$ ), they precipitate, and stabilized by macromols. of poly(DA-CL) form nuclei of microspheres. The number of particles formed in the initial period of the pseudoanionic **polymerization** of L,L-lactide and  $\epsilon$ -caprolactone remains constant whereas in the anionic **polymerization** of  $\epsilon$ -caprolactone a weak aggregation, manifested by decreasing number of particles, was observed

## Determination

of partition of monomer and active centers between continuous and condensed (particles) phases revealed that polymeric particles were highly swollen with monomer (e.g. after incubation of poly( $\epsilon$ -caprolactone) latex ( $[\text{poly}(\text{CL})] = 2.17 + 101 \text{ g/l}$ ) in a solution containing initially  $[\epsilon\text{-caprolactone}] = 7.50 + 10^{-2} \text{ mol/l}$ , 28% of monomer became incorporated into polymer particles) and that shortly after the initiation period all active centers were located inside growing latex particles. High local concns. of monomer and active centers resulted in rates of **polymerization** which were up to ca 25 times higher than the rates of similar **polymerization** with the same monomer and initiator concns. averaged over the whole volume of the reaction mixts. Diams. of obtained poly( $\epsilon$ -caprolactone) latex particles were in the region from 0.6 to 0.7  $\mu\text{m}$  and diams. of poly(lactide) microspheres varied from 2.2 to 4.2  $\mu\text{m}$  depending on the **polymerization** conditions. Polydispersity of particle diams. was found to be strongly dependent on the ratio of mol. weight of poly( $\epsilon$ -caprolactone) grafts and mol. weight of poly(DA-CL) copolymer. The most uniform poly(L,L-lactide) microspheres ( $D_v/D_{nn} < 1.05$ ) were obtained when the value of this parameter was close to 0.25. Polymers in poly(lactide) and poly( $\epsilon$ -caprolactone) particles were characterized by a narrow mol. weight distribution ( $1.05 < M_w/M_n < 1.3$ ). In the case of the anionic dispersion **polymerization** of  $\epsilon$ -caprolactone, the intra- and intermol. transesterification side reactions were reduced and latexes were obtained made of polymer with  $M_n > 100,000$ , free from the admixt. of cyclic oligomers and with  $M_w/M_n = 1.06$ .

IT 26680-10-4P, Lactide homopolymer 33135-50-1P, L-Lactide homopolymer

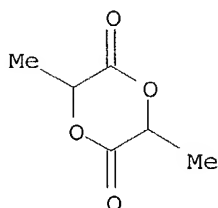
RL: SPN (Synthetic preparation); PREP (Preparation)  
(latexes and microspheres by ring-opening **polymerization** of cyclic esters)

RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5  
CMF C6 H8 O4

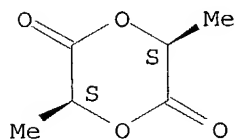


RN 33135-50-1 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6  
CMF C6 H8 O4

Absolute stereochemistry.



CC 35-7 (Chemistry of Synthetic High Polymers)  
ST caprolactone lactide ring opening polymn  
IT **Polymerization**  
(anionic, ring-opening; latexes and microspheres by ring-opening polymerization of cyclic esters)  
IT Polyesters, preparation  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(caprolactone-based; latexes and microspheres by ring-opening polymerization of cyclic esters)  
IT Polyesters, preparation  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(lactide; latexes and microspheres by ring-opening polymerization of cyclic esters)  
IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,  
Poly[oxy(1-oxo-1,6-hexanediyl)] 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26161-42-2P, L-Lactide homopolymer, sru 26680-10-4P  
, Lactide homopolymer 33135-50-1P, L-Lactide homopolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(latexes and microspheres by ring-opening polymerization of cyclic esters)

IT 160950-41-4, Dodecyl acrylate- $\epsilon$ -caprolactone graft copolymer  
RL: NUU (Other use, unclassified); USES (Uses)  
(surfactant; latexes and microspheres by ring-opening polymerization  
of cyclic esters)

REFERENCE COUNT: 19 THERE ARE 19 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 33 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:213628 CAPLUS

DOCUMENT NUMBER: 130:352619

TITLE: Controlled polymerization of cyclic  
esters. Covalent metal alkoxides vs.  
carboxylates: Sn(OC4H9)2 vs. Sn(OC(O)C7H15) (viz  
Sn(Oct)2)

AUTHOR(S): Penczek, Stanislaw; Duda, Andrzej; Kowalski, Adam;  
Libiszowski, Jan

CORPORATE SOURCE: Center of Molecular and Macromolecular Studies,  
Department of Polymer Chemistry, Polish Academy of  
Sciences, Lodz, PL-90-363, Pol.

SOURCE: Polymeric Materials Science and Engineering (1999),  
80, 95-96

CODEN: PMSEDG; ISSN: 0743-0515

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Sn(OC(O)C7H15)2 (viz Sn(Oct)2) needs a coinitiator to initiate  
polymerization of cyclic esters ( $\epsilon$ -  
caprolactone and L,L-dilactide were studied). When  
[Sn(Oct)2]0/[coinitiator]0 is higher then approx. 2, then further increase  
of [Sn(Oct)2]0/[coinitiator]0 ratio does not increase the rate, that  
levels off. Thus, if e.g. C4H9OH is taken as a coinitiator, then first  
the interconversion Sn(Oct)2 + C4H9OH = OctSnOC4H9 + OctH takes place.  
Since octanoic acid (OctH) is formed, this conclusion was verified from  
the "other end", namely by assuming the following interexchange:  
Sn(OC4H9)2 + OctH = OctSnOnC4H9 + C4H9OH. Indeed, at certain ratios of  
[Sn(Oct)2]0/[C4H9OH]0 and [Sn(OC4H9)2]0/[OctH]0 the rates of  
cyclic esters polymerization are identical,  
indicating that the positions of these two equilibrium are the same.

IT 33135-50-1P, L-Dilactide homopolymer  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(controlled polymerization of cyclic esters  
using tin butoxide or tin ethylhexanoate as catalyst)

RN 33135-50-1 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
INDEX NAME)

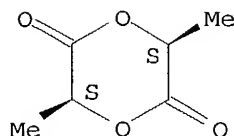
CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.





CC 35-3 (Chemistry of Synthetic High Polymers)  
 ST tin butoxide ethylhexanoate catalyst **polymn** caprolactone  
 dilactide  
 IT **Polymerization** catalysts  
 (controlled **polymerization** of **cyclic esters**  
 using tin butoxide or tin ethylhexanoate as catalyst)  
 IT Polyesters, preparation  
 RL: SPN (Synthetic preparation); **PREP** (Preparation)  
 (controlled **polymerization** of **cyclic esters**  
 using tin butoxide or tin ethylhexanoate as catalyst)  
 IT 71-36-3, 1-Butanol, uses 301-10-0, Tin bis(2-ethylhexanoate)  
 26306-46-7, Dibutoxytin  
 RL: CAT (Catalyst use); **USES** (Uses)  
 (controlled **polymerization** of **cyclic esters**  
 using tin butoxide or tin ethylhexanoate as catalyst)  
 IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  
 Poly[oxy(1-oxo-1,6-hexanediyl)] 26161-42-2P, L,L-Dilactide homopolymer,  
 sru 33135-50-1P, L-Dilactide homopolymer  
 RL: SPN (Synthetic preparation); **PREP** (Preparation)  
 (controlled **polymerization** of **cyclic esters**  
 using tin butoxide or tin ethylhexanoate as catalyst)  
 REFERENCE COUNT: 23 THERE ARE 23 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 34 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1999:211333 CAPLUS  
 DOCUMENT NUMBER: 130:352734  
 TITLE: Titanate-catalyzed ring-opening **polymerization**  
 of **cyclic** phthalate **ester**  
 oligomers  
 AUTHOR(S): Brunelle, Daniel J.; Serth-Guzzo, Judith  
 CORPORATE SOURCE: GE Corporate Research and Development, Schenectady,  
 NY, 12301, USA  
 SOURCE: Polymer Preprints (American Chemical Society, Division  
 of Polymer Chemistry) (1999), 40(1), 566-567  
 CODEN: ACPPAY; ISSN: 0032-3934  
 PUBLISHER: American Chemical Society, Division of Polymer  
 Chemistry  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English  
 AB Ring-opening **polymerization** of cyclic butylene terephthalate oligomers  
 takes place well below the m.p. of the product polymer, which crystallizes  
 following **polymerization** Although the **polymerization** generates  
 almost no exotherm, it is remarkably fast, reaching 50% **polymerization**

within 5 s at 190° C using 0.3 mol% titanate, ultimately providing polymer with only 1-2% cyclics remaining. During **polymerization**, the Mw increases from about 1000 to well over 100,000 in a matter of minutes, without formation of byproducts. **Polymerization** of butylene terephthalate cyclic dimer has been used as a model for probing the mechanism of titanate catalysis of transesterification reactions.

IT 224790-78-7P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(titanate-catalyzed ring-opening **polymerization** of cyclic phthalate **ester** oligomers)

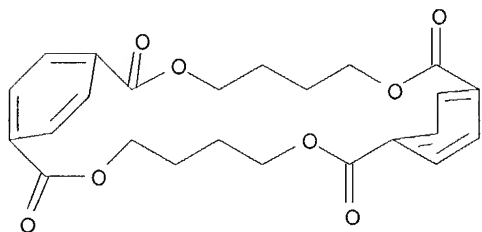
RN 224790-78-7 CAPLUS

CN 3,8,15,20-Tetraoxatricyclo[20.2.2.210,13]octacos-10,12,22,24,25,27-hexaene-2,9,14,21-tetrone, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 63440-93-7

CMF C24 H24 O8



CC 35-7 (Chemistry of Synthetic High Polymers)

ST butylene terephthalate cyclic oligomer **polymn**; titanate catalyst  
ring opening **polymn** butylene terephthalate

IT Polyesters, preparation

RL: RCT (Reactant); SPN (Synthetic preparation); PREP  
(**Preparation**); RACT (Reactant or reagent)  
(cyclic oligomers; titanate-catalyzed ring-opening **polymerization** of cyclic butylene terephthalate oligomers)

IT **Polymerization**

(ring-opening, mechanism of; titanate-catalyzed ring-opening  
**polymerization** of cyclic phthalate **ester**  
oligomers)

IT **Polymerization** catalysts

(ring-opening; titanate-catalyzed ring-opening **polymerization** of  
cyclic phthalate **ester** oligomers)

IT Group IVA element compounds

Group IVA element compounds

Group VIA element compounds

Group VIA element compounds

RL: CAT (Catalyst use); USES (Uses)

(stannoxanes, tin derivs.; titanate-catalyzed ring-opening  
**polymerization** of cyclic phthalate **ester**)

oligomers)

IT 24968-12-5P 59822-52-5P, 1,4-Butanediol-terephthaloyl chloride copolymer  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (cyclic oligomers; titanate-catalyzed ring-opening **polymerization** of  
 cyclic butylene terephthalate oligomers)

IT 546-68-9 1070-10-6, Tetrakis(2-ethylhexyl) titanate 5593-70-4,  
 Titanium(IV) butoxide  
 RL: CAT (Catalyst use); USES (Uses)  
 (titanate-catalyzed ring-opening **polymerization** of cyclic  
 phthalate **ester** oligomers)

IT 63440-93-7P  
 RL: RCT (Reactant); SPN (Synthetic preparation); **PREP**  
 (**Preparation**); RACT (Reactant or reagent)  
 (titanate-catalyzed ring-opening **polymerization** of cyclic  
 phthalate **ester** oligomers)

IT 224790-78-7P  
 RL: SPN (Synthetic preparation); **PREP** (**Preparation**)  
 (titanate-catalyzed ring-opening **polymerization** of cyclic  
 phthalate **ester** oligomers)

REFERENCE COUNT: 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 35 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1999:64812 CAPLUS

DOCUMENT NUMBER: 130:139768

TITLE: Metal complexes with a tridentate ligand, their  
 preparation and use as **polymerization**  
 catalysts

INVENTOR(S): Bertrand, Guy; Cazaux, Jean-Bernard; Faure, Jean-Luc;  
 Nguyen, Hanh; Reau, Regis

PATENT ASSIGNEE(S): Societe de Conseils de Recherches et d'Applications  
 Scientifiques (S.C.R.A.S.), Fr.; Centre National de la  
 Recherche Scientifique (CNRS)

SOURCE: PCT Int. Appl., 24 pp.  
 CODEN: PIXXD2

DOCUMENT TYPE: Patent

LANGUAGE: French

FAMILY ACC. NUM. COUNT: 2

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
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WO 9902536	A1	19990121	WO 1998-FR1433	19980706
W:	AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE,			
	DK, EE, ES, FI, GB, GE, GH, GM, GW, HR, HU, ID, IL, IS, JP, KE,			
	KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW,			
	MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR,			
	TT, UA, UG, US, UZ, VN, YU, ZW, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM			
RW:	GH, GM, KE, LS, MW, SD, SZ, UG, ZW, AT, BE, CH, CY, DE, DK, ES,			
	FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI,			
	CM, GA, GN, ML, MR, NE, SN, TD, TG			

AU 9885442	A1	19990208	AU 1998-85442	19980706
EP 998478	A1	20000510	EP 1998-936450	19980706
EP 998478	B1	20021009		

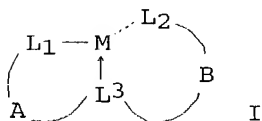
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI

AT 225795	E	20021015	AT 1998-936450	19980706
RU 2197494	C2	20030127	RU 2000-102898	19980706
US 6303807	B1	20011016	US 1999-446793	19991223
NO 2000000049	A	20000106	NO 2000-49	20000106

PRIORITY APPLN. INFO.: EP 1997-401621 A 19970708  
WO 1998-FR1433 W 19980706

OTHER SOURCE(S): MARPAT 130:139768

GI



AB Compds. consisting of an element of Group 11, 12, or 14 and a tridentate ligand are useful as **polymerization** catalysts, especially for **cyclic esters** or epoxides. Thus, mixing 4.7 mmol of the di-Li salt of (Me<sub>3</sub>SiNHCH<sub>2</sub>CH<sub>2</sub>)<sub>2</sub>NMe in 20 mL Et<sub>2</sub>O with 4.7 mmol SnCl<sub>2</sub> at -78°, allowing the mixture to warm to room temperature, and stirring at room temperature for 2

h gave the 1:1 complex (I) in 80% yield. Heating 6.67 g DL-lactide in 70 mL toluene with 0.08 g I at 75° for 2.5 h gave 60% of a polymer with Mw 62,500 and Mw/Mn 1.43.

IT 26680-10-4P, Poly-DL-lactide 26780-50-7P,  
Glycolide-DL-lactide copolymer 107131-72-6P,  
Glycolide-DL-lactide block copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)  
(metal complexes with a tridentate ligand as **polymerization** catalysts)

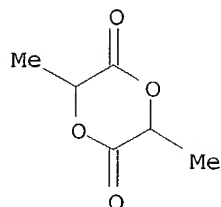
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



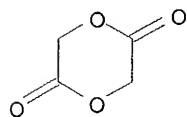
RN 26780-50-7 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione  
(9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

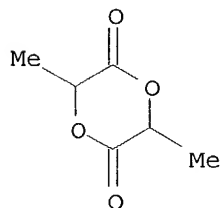
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



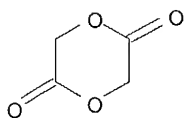
RN 107131-72-6 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione,  
block (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

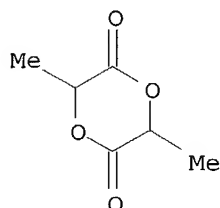
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



IC ICM C07F007-22  
ICS C08F004-16; C07F003-06; C07F007-10  
CC 35-3 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 67  
ST tin triamine complex **polymn** catalyst; **cyclic ester polymn** complex catalyst  
IT Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(aliphatic; metal complexes with a tridentate ligand as **polymerization** catalysts)  
IT **Polymerizats** catalysts  
(metal complexes with a tridentate ligand as **polymerization** catalysts)  
IT Epoxides  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(metal complexes with a tridentate ligand as **polymerization** catalysts for)  
IT 219825-26-0P 220028-26-2P  
RL: CAT (Catalyst use); SPN (Synthetic preparation); **PREP (Preparation)**; USES (Uses)  
(metal complexes with a tridentate ligand as **polymerization** catalysts)  
IT 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P  
, Poly-DL-lactide 26780-50-7P, Glycolide-DL-lactide copolymer 107131-72-6P, Glycolide-DL-lactide block copolymer  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(metal complexes with a tridentate ligand as **polymerization** catalysts)  
IT 219825-25-9P  
RL: SPN (Synthetic preparation); **PREP (Preparation)**

(metal complexes with a tridentate ligand as **polymerization**  
catalysts)  
IT 75-56-9, reactions  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(metal complexes with a tridentate ligand as **polymerization**  
catalysts for)  
REFERENCE COUNT: 3 THERE ARE 3 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 36 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:648293 CAPLUS

DOCUMENT NUMBER: 129:343788

TITLE: Direct synthesis of polyester microspheres, potential  
carriers of bioactive compounds

AUTHOR(S): Slomkowski, S.; Sosnowski, S.; Gadzinowski, M.;  
Pichot, C.; Elaissari, A.

CORPORATE SOURCE: Center of Molecular and Macromolecular Studies, Polish  
Academy of Science, Lodz, 90-363, Pol.

SOURCE: ACS Symposium Series (1998), 709(Tailored Polymeric  
Materials for Controlled Delivery Systems), 143-153  
CODEN: ACSMC8; ISSN: 0097-6156

PUBLISHER: American Chemical Society

DOCUMENT TYPE: Journal

LANGUAGE: English

AB Polyester microspheres, composed of poly( $\epsilon$ -caprolactone) and  
polylactides, were obtained directly by pseudoionic and/or ionic  
dispersion **polymns.** of parent **cyclic esters**  
carried out in 1,4-dioxane/heptane mixed solvent. Particles with narrow  
diameter polydispersity ( $D_w/D_n < 1.1$ ) were synthesized by using  
poly(dodecyl acrylate)-g-poly( $\epsilon$ -caprolactone) (poly(DA-CL)), with  
ratio of  $M_n(\text{poly}(\epsilon\text{-caprolactone}))/M_n(\text{poly(DA-CL)}) \approx 0.25$ ,  
as a surfactant. Poly(L,L-lactide) microspheres were obtained as an  
amorphous or crystalline material, depending on particle treatment after  
synthesis. Described is an application of  $^{13}\text{C}$ -NMR MAS spectroscopy for  
determination of the degree of crystallinity of these products. Pseudoanionic  
dispersion **polymerization** of L,L-lactide carried out in the presence of  
omeprazole (5-methoxy-2-[[4-methoxy-3,5-dimethyl-2-pyridyl]-methyl]-  
sulfinyl]-1H-benzimidazole), inhibitor of gastric acid secretion, yielded  
microspheres with 11 wt% of drug. A method was developed which allows  
transfer of poly( $\epsilon$ -caprolactone) and polylactide microspheres from  
heptane to the water based media in which microspheres form suspensions of  
nonaggregated particles. This process consists of controlled basic  
hydrolysis of microspheres transferred from heptane to ethanol containing  
Triton X-405, followed by transferring them to buffered solns. with  
content of Triton X-405 as low as 0.2 wt%.

IT 33135-50-1P, Poly(L-Lactide)

RL: BUU (Biological use, unclassified); PRP (Properties); SPN  
(**Synthetic preparation**); BIOL (Biological study); PREP  
(**Preparation**); USES (Uses)

(microspheres; polyester microsphere preparation and characterization as  
bioactive compound carriers)

RN 33135-50-1 CAPLUS

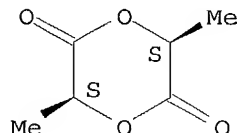
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 38, 63

ST polycaprolactone microsphere dispersion ionic **polymn** synthesis;  
 polylactide microsphere dispersion pseudoanionic **polymn**  
 synthesis; omeprazole carrier polylactide microsphere prepn  
 characterization

IT Drug delivery systems  
 (microspheres; polyester microsphere preparation and characterization as  
 bioactive compound carriers)

IT Crystallinity  
 (of poly(L-lactide) microspheres)

IT Polyesters, preparation  
 RL: BUU (Biological use, unclassified); SPN (Synthetic preparation); BIOL  
 (Biological study); **PREP (Preparation)**; USES (Uses)  
 (polyester microsphere preparation and characterization as bioactive  
 compound

carriers)

IT Surfactants  
 (ε-caprolactone-dodecyl acrylate graft copolymer; polyester  
 microsphere preparation by dispersion **polymerization** in the presence of)

IT 33135-50-1P, Poly(L-Lactide)  
 RL: BUU (Biological use, unclassified); PRP (Properties); SPN  
 (**Synthetic preparation**); BIOL (Biological study); **PREP**  
 (**Preparation**); USES (Uses)  
 (microspheres; polyester microsphere preparation and characterization as  
 bioactive compound carriers)

IT 26161-42-2P  
 RL: BUU (Biological use, unclassified); SPN (Synthetic preparation); BIOL  
 (Biological study); **PREP (Preparation)**; USES (Uses)  
 (microspheres; polyester microsphere preparation and characterization as  
 bioactive compound carriers)

IT 73590-58-6, Omeprazole  
 RL: MSC (Miscellaneous)  
 (poly(L-lactide) microsphere preparation and characterization as bioactive  
 compound carriers for)



IT 160950-41-4,  $\epsilon$ -Caprolactone-Dodecyl acrylate graft copolymer  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (surfactant; polyester microsphere preparation by dispersion polymn  
 . in the presence of)

REFERENCE COUNT: 38 THERE ARE 38 CITED REFERENCES AVAILABLE FOR THIS  
 RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 37 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:410718 CAPLUS

DOCUMENT NUMBER: 129:95861

TITLE: Polycarbonate copolyester diols their preparation and  
 use

INVENTOR(S): Greco, Alberto

PATENT ASSIGNEE(S): Enichem S.P.A., Italy

SOURCE: Eur. Pat. Appl., 24 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 849303	A2	19980624	EP 1997-119779	19971112
EP 849303	A3	19980812		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
US 5929193	A	19990727	US 1997-974917	19971120
JP 11001549	A2	19990106	JP 1997-351784	19971219
PRIORITY APPLN. INFO.:			IT 1996-MI2662	19961219

AB Polycarbonate co-polyester diols with a mol. weight 1000-6000, the  
 polycarbonate or polyether polycarbonate diol units represent 30-70%, are  
 prepared by reaction of **cyclic esters**, glycolide or  
 lactide with polycarbonate or polyethercarbonate diols at 100-180°  
 for 2-10 h. Thus, liquid diethylene glycol-dimethyl carbonate- $\epsilon$ -  
 caprolactone copolymer (I) had glass transition temperature (Tg) -50°.  
 The butanediol-I-MDI thermoplastic elastomer (NCO index 1.03) had Tg  
 -32.7, gas oil absorption 2.8%, and tensile strength retention  
 (120°) 74%.

IT 209729-46-4P, Diethylene glycol-dimethyl carbonate-L-lactide block  
 copolymer

RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
 (Preparation); RACT (Reactant or reagent)

(polycarbonate copolyester diols preparation and use for polyurethane  
 elastomers having heat and oil resistance and good mech. properties)

RN 209729-46-4 CAPLUS

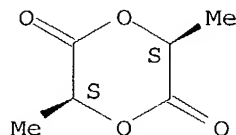
CN Carbonic acid, dimethyl ester, polymer with (3S-cis)-3,6-dimethyl-1,4-  
 dioxane-2,5-dione and 2,2'-oxybis[ethanol], block (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

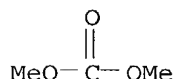
Absolute stereochemistry.



CM 2

CRN 616-38-6

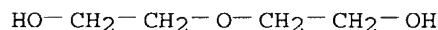
CMF C3 H6 O3



CM 3

CRN 111-46-6

CMF C4 H10 O3



IC ICM C08G063-64

ICS C08G018-44

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 38, 39

ST polyether polycarbonate polyester block manuf; **cyclic ester polymn** polycarbonate diol

IT **Polymerization**

(polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)

IT Polyesters, preparation

Polyesters, preparation

RL: IMF (Industrial manufacture); **PREP (Preparation)**

(polycarbonate-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)

IT Polyethers, preparation

Polyethers, preparation

Polyethers, preparation

RL: IMF (Industrial manufacture); **PREP (Preparation)**

- (polycarbonate-polyester-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Urethane rubber, preparation  
Urethane rubber, preparation  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(polycarbonate-polyester-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Urethane rubber, preparation  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(polycarbonate-polyester-polyether-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Synthetic rubber, preparation  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(polycarbonate-polyester-polyether-polyurethane, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Synthetic rubber, preparation  
Synthetic rubber, preparation  
RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or engineered material use); **PREP (Preparation)**; USES (Uses)  
(polycarbonate-polyester-polyurethane, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Polyesters, preparation  
Polyesters, preparation  
Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(polycarbonate-polyether-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Polycarbonates, preparation  
Polycarbonates, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(polyester-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT Polycarbonates, preparation  
Polycarbonates, preparation  
Polycarbonates, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(polyester-polyether-, block; polycarbonate copolyester diols preparation and use for polyurethane elastomers having heat and oil resistance and good mech. properties)
- IT 209729-41-9P, Diethylene glycol-dimethyl carbonate- $\epsilon$ -caprolactone block copolymer 209729-42-0P, 1,4-Butanediol-dimethyl carbonate- $\epsilon$ -caprolactone block copolymer 209729-43-1P, Dimethyl

carbonate-1,6-hexanediol-ε-caprolactone block copolymer  
 209729-44-2P, Diethylene glycol-dimethyl carbonate-ε-caprolactone-  
 tripropylene glycol block copolymer 209729-45-3P, Diethylene  
 glycol-dimethyl carbonate-δ-valerolactone block copolymer  
 209729-46-4P, Diethylene glycol-dimethyl carbonate-L-lactide block  
 copolymer 209729-48-6P, Dimethyl carbonate-ε-caprolactone-1,6-  
 hexanediol-norbornene dimethanol block copolymer

RL: IMF (Industrial manufacture); RCT (Reactant); PREP  
 (Preparation); RACT (Reactant or reagent)

(polycarbonate copolyester diols preparation and use for polyurethane  
 elastomers having heat and oil resistance and good mech. properties)

IT 209729-49-7P, 1,4-Butanediol-diethylene glycol-dimethyl  
 carbonate-ε-caprolactone-MDI block copolymer 209729-50-0P,  
 1,4-Butanediol-dimethyl carbonate-ε-caprolactone-MDI block  
 copolymer 209729-51-1P, 1,4-Butanediol-dimethyl carbonate-1,6-hexanediol-  
 ε-caprolactone-MDI block copolymer 209729-52-2P,  
 1,4-Butanediol-diethylene glycol-dimethyl carbonate-ε-caprolactone-  
 MDI-tripropylene glycol block copolymer 209729-53-3P,  
 1,4-Butanediol-diethylene glycol-dimethyl carbonate-MDI-δ-  
 valerolactone block copolymer

RL: IMF (Industrial manufacture); PRP (Properties); TEM (Technical or  
 engineered material use); PREP (Preparation); USES (Uses)

(rubber; polycarbonate copolyester diols preparation and use for  
 polyurethane elastomers having heat and oil resistance and good mech.  
 properties)

L32 ANSWER 38 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:392367 CAPLUS

DOCUMENT NUMBER: 129:109453

TITLE: Method for preparation of aliphatic polyesters

INVENTOR(S): Okano, Yoshimichi; Sakane, Masanori

PATENT ASSIGNEE(S): Daicel Chemical Industries, Ltd., Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 10158371	A2	19980616	JP 1996-336359	19961202

PRIORITY APPLN. INFO.: JP 1996-336359 19961202

AB The polymers, having good hydrolysis resistance and color tone, are prepared  
 by ring-opening polymerization of cyclic esters  
 having a water content of ≤80 ppm, and an acid value of  
 ≤0.10 mg KOH/g. Thus, heating lactide (prepared by decomposition of  
 L-lactic acid oligomer, water content 32 ppm, acid value 0.01 mg KOH/g) in  
 the presence of 1,4-butanediol and butyltin tris(2-ethylhexanoate) in  
 o-C6H4Cl2 at 180° gave 89.8% of a polymer with Mn 97,500, and acid  
 value 0.21 mg KOH/g.

IT 33135-50-1P, L-Lactide homopolymer

RL: IMF (Industrial manufacture); PRP (Properties); PREP  
(Preparation)

(preparation of aliphatic polyesters with good hydrolysis resistance and  
color  
tone)

RN 33135-50-1 CAPLUS

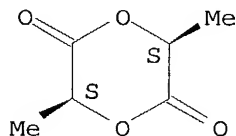
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C08G063-08

ICS C08G063-78; C08G063-82

CC 35-7 (Chemistry of Synthetic High Polymers)

ST **cyclic ester** ring opening **polymn**; lactide  
ring opening **polymn**; caprolactone ring opening **polymn**

IT Polyesters, preparation

RL: IMF (Industrial manufacture); PRP (Properties); PREP  
(Preparation)

(aliphatic; preparation of aliphatic polyesters with good hydrolysis  
resistance  
and color tone)

IT Biodegradable materials

(preparation of aliphatic polyesters with good hydrolysis resistance and  
color  
tone)

IT 23850-94-4, Butyltin tris(2-ethylhexanoate)

RL: CAT (Catalyst use); USES (Uses)

(preparation of aliphatic polyesters with good hydrolysis resistance and  
color  
tone)

IT 24980-41-4P, Polycaprolactone 33135-50-1P, L-Lactide homopolymer

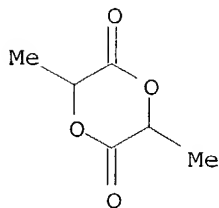
50974-93-1P 59692-54-5P 114572-03-1P

RL: IMF (Industrial manufacture); PRP (Properties); PREP  
(Preparation)

(preparation of aliphatic polyesters with good hydrolysis resistance and  
color  
tone)

L32 ANSWER 39 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:221289 CAPLUS  
 DOCUMENT NUMBER: 128:270889  
 TITLE: Stereochemical aspects of the controlled ring-opening  
 polymerization of chiral cyclic  
 esters  
 AUTHOR(S): Spassky, Nicolas; Pluta, Christian; Simic, Vesna;  
 Thiam, Mohamedou; Wisniewski, Muriel  
 CORPORATE SOURCE: Laboratoire Chimie Macromoleculaire, Universite Pierre  
 et Marie Curie, Paris, F-75252, Fr.  
 SOURCE: Macromolecular Symposia (1998), 128(International  
 Symposium on New Approaches in Polymer Synthesis and  
 Macromolecular Formation, 1997), 39-51  
 CODEN: MSYMEC; ISSN: 1022-1360  
 PUBLISHER: Huethig & Wepf Verlag  
 DOCUMENT TYPE: Journal; General Review  
 LANGUAGE: English  
 AB A review with 55 refs. discussing stereochem. aspects of controlled  
 polymerization of lactide and  $\beta$ -butyrolactone. The physicochem. and  
 thermal properties of these polymers are shown to be depending on the  
 stereochem. structure of the macromol. chain. Different types of  
 processes involving change of enantiomeric composition in the course of the  
 polymerization reaction are examined in function of different initiators  
 used. The formation of stereocomplexes from stereocopolymers of various  
 enantiomeric compns. is reported.  
 IT 26680-10-4P, Polylactide  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (stereochem.in controlled ring-opening polymerization of chiral  
 cyclic esters)  
 RN 26680-10-4 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 95-96-5  
 CMF C6 H8 O4



CC 35-0 (Chemistry of Synthetic High Polymers)  
 ST review polymn lactide lactone stereochem  
 IT Polyesters, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)

(stereochem.in controlled ring-opening polymerization of chiral cyclic esters)

IT Lactones  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(stereochem.in controlled ring-opening polymerization of chiral cyclic esters)

IT 96-48-ODP, Butyrolactone, derivs. polymers 26023-30-3P,  
Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P,  
Polylactide  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(stereochem.in controlled ring-opening polymerization of chiral cyclic esters)

L32 ANSWER 40 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1998:133140 CAPLUS

DOCUMENT NUMBER: 128:167785

TITLE: A novel rare earth coordination catalyst for polymerization of biodegradable aliphatic lactones and lactides

AUTHOR(S): Zhang, Jie; Gan, Zhihua; Zhong, Zhiyuan; Jing, Xiabin

CORPORATE SOURCE: College of Science, Jilin University of Technology, Changchun, 130025, Peop. Rep. China

SOURCE: Polymer International (1998), 45(1), 60-66  
CODEN: PLYIEI; ISSN: 0959-8103

PUBLISHER: John Wiley & Sons Ltd.

DOCUMENT TYPE: Journal

LANGUAGE: English

AB A novel rare earth coordination system composed of lanthanide trifluoroacetates  $\text{Ln}(\text{CF}_3\text{COO})_3$  ( $\text{Ln} = \text{Y}, \text{Yb}, \text{Nd}, \text{Tm}, \text{Ho}, \text{La}, \text{Pr}$ ) and triisobutylaluminium  $\text{Al}(\text{i-Bu})_3$  was used as catalyst for the polymn. of  $\epsilon$ -caprolactone (CL), D,L-lactide (DLLA) and their copolymn. The influence of temperature, time and catalyst concentration on polymerization yields and mol. wts. of the polyesters have been studied. The ring-opening polymerization of cyclic esters catalyzed by  $\text{Ln}(\text{CF}_3\text{COO})_3/\text{Al}(\text{i-Bu})_3$  has some living character and the mol. weight of the polyester could be controlled by adjusting the molar ratio of monomer to catalyst. The DLLA/CL copolymer was synthesized by sequential addition of monomers and the structure of the copolyester was characterized by GPC, NMR and DSC.

IT 26680-10-4P, D,L-Lactide homopolymer 70524-20-8P,  
 $\epsilon$ -Caprolactone-D,L-lactide copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); PREP (Preparation)  
(novel rare earth coordination catalyst for polymerization of biodegradable aliphatic lactones and lactides)

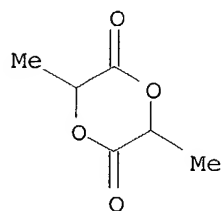
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



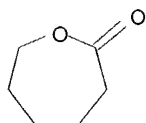
RN 70524-20-8 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 2-oxepanone (9CI) (CA INDEX NAME)

CM 1

CRN 502-44-3

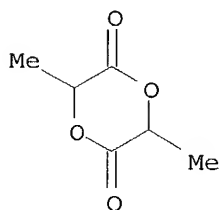
CMF C6 H10 O2



CM 2

CRN 95-96-5

CMF C6 H8 O4



CC 35-7 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67

ST lanthanide trifluoroacetate catalyst caprolactone lactide **polymn**  
; triisobutylaluminium lanthanide trifluoroacetate **polymn**  
catalyst; biodegradable polyester caprolactone lactide **polymn**  
catalyst; rare earth coordination catalyst lactide **polymn**; ring  
opening **polymn** caprolactone lactide polyester

IT Polymers, preparation



RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(**Preparation**)  
(biodegradable; novel rare earth coordination catalyst for  
**polymerization** of biodegradable aliphatic lactones and lactides)

IT Polyesters, preparation  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(**Preparation**)  
(novel rare earth coordination catalyst for **polymerization** of  
biodegradable aliphatic lactones and lactides)

IT Molecular weight  
(of biodegradable aliphatic lactones and lactide polymers)

IT **Polymerization**  
**Polymerization** catalysts  
(ring-opening; novel rare earth coordination catalyst for  
**polymerization** of biodegradable aliphatic lactones and lactides)

IT 24980-41-4P,  $\epsilon$ -Caprolactone homopolymer 25248-42-4P,  
 $\epsilon$ -Caprolactone homopolymer, sru 26023-30-3P, D,L-Lactide  
homopolymer, sru 26680-10-4P, D,L-Lactide homopolymer  
70524-20-8P,  $\epsilon$ -Caprolactone-D,L-lactide copolymer  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP**  
(**Preparation**)  
(novel rare earth coordination catalyst for **polymerization** of  
biodegradable aliphatic lactones and lactides)

IT 100-99-2, uses.  
RL: CAT (Catalyst use); **USES** (Uses)  
(with lanthanide; novel rare earth coordination catalyst for  
**polymerization** of biodegradable aliphatic lactones and lactides)

IT 29770-44-3, Neodymium trifluoroacetate 37737-28-3, Yttrium  
trifluoroacetate 70236-92-9, Lanthanum trifluoroacetate 70236-94-1,  
Praseodymium trifluoroacetate 70236-98-5, Holmium trifluoroacetate  
70237-00-2, Thulium trifluoroacetate 87863-62-5, Ytterbium  
trifluoroacetate  
RL: CAT (Catalyst use); **USES** (Uses)  
(with triisobutylaluminium; novel rare earth coordination catalyst for  
**polymerization** of biodegradable aliphatic lactones and lactides)

REFERENCE COUNT: 28 THERE ARE 28 CITED REFERENCES AVAILABLE FOR THIS  
RECORD. ALL CITATIONS AVAILABLE IN THE RE FORMAT

L32 ANSWER 41 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1997:746051 CAPLUS  
DOCUMENT NUMBER: 127:359233  
TITLE: Preparation of Group IIIA complexes containing one  
mono- or di-anionic tridentate ligand and their use as  
**polymerization** catalysts  
INVENTOR(S): Bertrand, Guy; Cazaux, Jean-Bernard; Emig, Norbert;  
Reau, Regis  
PATENT ASSIGNEE(S): Societe De Conseils De Recherches Et D'applications  
Scientifiques (S.C.R.A.S, Fr.; Centre National De La  
Recherche Scientifique (C.N.R.S)  
SOURCE: PCT Int. Appl., 26 pp.  
CODEN: PIXXD2  
DOCUMENT TYPE: Patent

LANGUAGE: French  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9742197	A1	19971113	WO 1997-FR773	19970430
W: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GE, GH, HU, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, AM, AZ, BY, KG, KZ, MD, RU, TJ, TM RW: GH, KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG				
AU 9727801	A1	19971126	AU 1997-27801	19970430
AU 724206	B2	20000914		
CN 1220669	A	19990623	CN 1997-195140	19970430
CN 1091110	B	20020918		
BR 9708967	A	19990803	BR 1997-8967	19970430
JP 2000509706	T2	20000802	JP 1997-539583	19970430
EP 1027357	A1	20000816	EP 1997-921914	19970430
EP 1027357	B1	20020403		
R: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LI, LU, NL, SE, MC, PT, IE, FI				
RU 2180664	C2	20020320	RU 1998-121685	19970430
AT 215543	E	20020415	AT 1997-921914	19970430
IL 126682	A1	20020725	IL 1997-126682	19970430
PT 1027357	T	20020731	PT 1997-921914	19970430
ES 2174254	T3	20021101	ES 1997-921914	19970430
US 6281154	B1	20010828	US 1998-171940	19981028
NO 9805061	A	19981229	NO 1998-5061	19981030
KR 2000010703	A	20000225	KR 1998-708789	19981031
PRIORITY APPLN. INFO.:			EP 1996-400938	A 19960502
			WO 1997-FR773	W 19970430

OTHER SOURCE(S): MARPAT 127:359233

AB The invention discloses [RM(L1AL3BL2)] and [RMM(R1L1AL3BL2)]+[X1]- (M = Group IIIA element; RM = H, halogen, alkyl, cycloalkyl, aryl, alkoxy, cycloalkoxy, aryloxy, alkylthio, cycloalkylthio, arylthio; A/B = C2-4 chain; L1/L2/L3 = -E15(R15)- in which E15 = Group VA element, R15 = H, alkyl, cycloalkyl, aryl, RR'R'E14 (E14 = Group IVA element; R/R'/R'' = H, alkyl, cycloalkyl, aryl, alkoxy, cycloalkoxy, aryloxy, alkylthio, cycloalkylthio, arylthio), SO2R'15 (R'15 = halogen, alkyl, haloalkyl, aryl); X1 = anion not coordinated to M; R1 = H, RR'R'E14, alkyl, cycloalkyl, aryl), a method of their preparation, and their use as (co) **polymerization** catalysts. The preparation involves reaction of Y2(L1AL3BL2) (Y = organometallic group, metal, H) with RMMZ1Z2 (Z1/Z2 = leaving groups) to give [RM(L1AL3BL2)], which can be reacted with R1X1 to give [RMM(R1L1AL3BL2)]+[X1]-. [RMMX(R1L1AL3BL2)] (X = coordinated anion) can be further reacted with MX'3 (X' = halogen, alkyl, alkoxy) to give [RMM(R1L1AL3BL2)]+[X1]-. For example, [(Me3SiNCH2CH2)2NSiMe3]AlCl1 was prepared from 9.6 mmol Li2[(Me3SiNCH2CH2)2NSiMe3] and 10 mmol AlCl3 in THF;

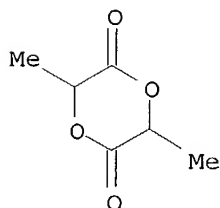
0.5 mmol  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)_2\text{NSiMe}_3]\text{AlCl}$  reacts with 1 mmol HCl in Et<sub>2</sub>O/toluene followed by 0.67 mmol AlCl<sub>3</sub> to give  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)(\text{Me}_3\text{SiNHCH}_2\text{CH}_2)\text{NSiMe}_3]\text{AlCl}[\text{AlCl}_4]$ . The crystal and mol. structures of  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)_2\text{NSiMe}_3]\text{AlCl}$ ,  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)_2\text{NMe}]\text{AlCl}$ ,  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)_2\text{NMe}]\text{AlH}$ ,  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)_2\text{NMe}]\text{AlMe}$ ,  $[(\text{iPrNCH}_2\text{CH}_2)(\text{iPrNHCH}_2\text{CH}_2)\text{NMe}]\text{AlCl}[\text{AlCl}_4]$ , and  $[(\text{Me}_3\text{SiNCH}_2\text{CH}_2)(\text{Me}_3\text{SiNHCH}_2\text{CH}_2)\text{NSiMe}_3]\text{AlCl}[\text{AlCl}_4]$  were determined by x-ray crystallog. The catalytic effectiveness of the above complexes was shown for **polymerization** of propene oxide, DL-lactide and mixts. DL-lactide and glycolide.

IT 26680-10-4P, Poly(DL-lactide) 26780-50-7P,  
Glycolide-DL-lactide copolymer  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(preparation of Group IIIA complexes containing one mono- or di-anionic tridentate ligand and use as **polymerization** catalysts)  
RN 26680-10-4 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4

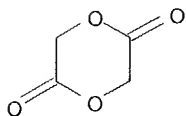


RN 26780-50-7 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

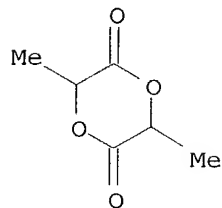
CRN 502-97-6

CMF C4 H4 O4



CM 2

CRN 95-96-5  
CMF C6 H8 O4



- IC ICM C07F007-10  
ICS C07F005-00; C07F005-06; C08F010-00
- CC 35-3 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 29, 67, 75, 78
- ST crystal structure aluminum triamine anion complex; mol structure aluminum triamine anion complex; epoxide **polymn** catalyst aluminum triamine anion; **cyclic ester polymn** catalyst aluminum triamine; **polymn** catalyst aluminum triamine anion complex; aluminum triamine anion complex prepn catalysis
- IT Crystal structure  
Molecular structure  
(of aluminum complexes with triamine mono- and dianions)
- IT Group IIIA element complexes  
RL: CAT (Catalyst use); SPN (Synthetic preparation); **PREP** (**Preparation**); USES (Uses)  
(preparation of Group IIIA complexes containing one mono- or di-anionic tridentate ligand and use as **polymerization** catalysts)
- IT Polyesters, preparation  
Polyoxyalkylenes, preparation  
RL: IMF (Industrial manufacture); **PREP** (**Preparation**)  
(preparation of Group IIIA complexes containing one mono- or di-anionic tridentate ligand and use as **polymerization** catalysts)
- IT **Polymerization** catalysts  
(ring-opening; preparation of Group IIIA complexes containing one mono- or di-anionic tridentate ligand and use as **polymerization** catalysts)
- IT 198571-92-5P 198571-94-7P 198571-96-9P  
RL: PRP (Properties); SPN (Synthetic preparation); **PREP** (**Preparation**)  
(preparation and crystal structure of)
- IT 198571-95-8P  
RL: SPN (Synthetic preparation); **PREP** (**Preparation**)  
(preparation of)
- IT 25322-69-4P, Polypropylene glycol 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P, Poly(DL-lactide) 26780-50-7P, Glycolide-DL-lactide copolymer  
RL: IMF (Industrial manufacture); **PREP** (**Preparation**)  
(preparation of Group IIIA complexes containing one mono- or di-anionic tridentate ligand and use as **polymerization** catalysts)
- IT 198571-93-6P

RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation);  
**PREP (Preparation)**; USES (Uses)  
 (preparation, crystal structure and catalysis of **polymerization of cyclic esters**)

IT 177854-55-6P

RL: CAT (Catalyst use); PRP (Properties); SPN (Synthetic preparation);  
**PREP (Preparation)**; USES (Uses)  
 (preparation, crystal structure and catalysis of **polymerization of propylene oxide**)

IT 177854-52-3P

RL: CAT (Catalyst use); PRP (Properties); RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent);  
 USES (Uses)  
 (preparation, crystal structure, reaction with hydrochloric acid and catalysis of **polymerization of propylene oxide**)

IT 160788-45-4

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with aluminum chloride)

IT 198571-98-1

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with hydrochloric acid)

IT 75-24-1, Trimethylaluminum 16853-85-3, Lithium aluminum hydride

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction with methylbis(((trimethylsilyl)amino)ethyl)amine)

IT 198571-97-0, Methylbis(2-(((trimethylsilyl)amino)ethyl)amine

RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reactions with lithium aluminum hydride and trimethylaluminum)

L32 ANSWER 42 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:739380 CAPLUS

DOCUMENT NUMBER: 128:3996

TITLE: **Cyclic ester** preparation and  
 purification by aqueous solvent extraction for  
 preparation of high molecular weight polymers

INVENTOR(S): Miao, Fudu; Eggeman, Timothy J.

PATENT ASSIGNEE(S): Chronopol, Inc., USA

SOURCE: U.S., 18 pp., Cont.-in-part of U.S. Ser. No. 417,597.  
 CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 17

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5686630	A	19971111	US 1995-473400	19950606
US 5420304	A	19950530	US 1993-128797	19930929
US 5675021	A	19971007	US 1995-417597	19950405
WO 9631494	A1	19961010	WO 1996-US4464	19960401

W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE,

SG, SI

RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR,  
IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML

AU 9653824 A1 19961023 AU 1996-53824 19960401

EP 836598 A1 19980422 EP 1996-910701 19960401

R: BE, DE, ES, FR, GB, NL

CN 1186490 A 19980701 CN 1996-194422 19960401

JP 11503162 T2 19990323 JP 1996-530411 19960401

BR 9604801 A 19991130 BR 1996-4801 19960401

US 5856523 A 19990105 US 1997-940592 19970930

PRIORITY APPLN. INFO.:

US 1993-128797 A2 19930929

US 1995-417597 A2 19950405

US 1992-854559 A2 19920319

US 1995-473400 A 19950606

WO 1996-US4464 W 19960401

WO 1996-US4465 W 19960401

AB **Cyclic esters** for use in preparation of high-mol.-weight polymers are purified by introducing an aqueous solvent into a **cyclic ester**-containing composition and allowing two phases to form. The first phase includes **cyclic esters** and any organic solvent, and the second phase includes the aqueous solvent and impurities. Thus, crude tetra-Me glycolide, prepared from 2-hydroxy-2-methylpropionic acid, was refluxed to remove water, washed with Na<sub>2</sub>CO<sub>3</sub>, neutralized, dissolved in acetone, and passed through a column containing Amberlyst A 21 ion-exchange resin, dried, and recrystd. The purified tetra-Me glycolide was **polymerized** using lithium tert-butoxide catalyst for .apprx.8 h at .apprx.130°, giving a polymer having Mw 520,000 and Mn 354,000, compared with Mw 17,200 and Mn 14,525 using a non-ion-exchanged monomer.

IT 32474-74-1P, Tetramethyl glycolide homopolymer 33135-50-1P  
, L-Lactide homopolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(cyclic ester preparation and purification by aqueous solvent  
extraction for preparation of high mol. weight polymers)

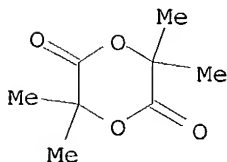
RN 32474-74-1 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,3,6,6-tetramethyl-, homopolymer (9CI) (CA INDEX  
NAME)

CM 1

CRN 6713-72-0

CMF C8 H12 O4



RN 33135-50-1 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA

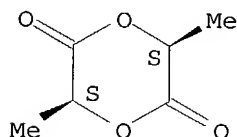
INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C07D319-00

ICS C07D319-12

NCL 549274000

CC 35-2 (Chemistry of Synthetic High Polymers)

ST **cyclic ester** prepn purifn **polymn**; glycolide  
tetramethyl prepn purifn **polymn**; ion exchange **cyclic ester** purifn; solvent extn **cyclic ester** purifn

IT Lactones

RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)  
(**cyclic ester** preparation and purification by aqueous solvent extraction for preparation of high mol. weight polymers)

IT Carboxylic acids, processes

RL: REM (Removal or disposal); PROC (Process)  
(hydroxy, derivs., impurities; **cyclic ester** preparation and purification by aqueous solvent extraction for preparation of high mol. weight polymers)

IT Carboxylic acids, processes

RL: REM (Removal or disposal); PROC (Process)  
(hydroxy, impurity; **cyclic ester** preparation and purification by aqueous solvent extraction for preparation of high mol. weight polymers)

IT Solvents

(in purification of **cyclic ester** for preparation of high mol. weight polymers)

IT 32474-74-1P, Tetramethyl glycolide homopolymer 33135-50-1P, L-Lactide homopolymer

RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(**cyclic ester** preparation and purification by aqueous solvent extraction for preparation of high mol. weight polymers)

IT 164790-46-9P 197568-83-5P

RL: IMF (Industrial manufacture); PUR (Purification or recovery); **PREP (Preparation)**  
(**cyclic ester** preparation and purification by aqueous solvent extraction for preparation of high mol. weight polymers)

IT 95-96-5P, Lactide 4511-42-6P, L-Lactide 6713-72-0P, Tetramethyl glycolide

RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)

(**cyclic ester** preparation and purification by aqueous solvent extraction for preparation of high mol. weight polymers)

IT 71-43-2, Benzene, uses 100-66-3, Anisole, uses 108-10-1, Methyl isobutyl ketone 108-20-3, Isopropyl ether 108-88-3, Toluene, uses 111-13-7, 2-Octanone 1330-20-7, Xylene, uses

RL: NUU (Other use, unclassified); USES (Uses)

(in purification of **cyclic ester** for preparation of high mol. weight polymers)

L32 ANSWER 43 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:684166 CAPLUS

DOCUMENT NUMBER: 127:319376

TITLE: Method to produce and purify **cyclic esters**

INVENTOR(S): Eggeman, Timothy J.; Benecke, Herman P.

PATENT ASSIGNEE(S): Chronopol, Inc., USA

SOURCE: U.S., 19 pp., Cont.-in-part of U.S. 5,420,304.

CODEN: USXXAM

DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 17

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
US 5675021	A	19971007	US 1995-417597	19950405
US 5319107	A	19940607	US 1992-854559	19920319
US 5420304	A	19950530	US 1993-128797	19930929
US 5686630	A	19971111	US 1995-473400	19950606
TW 457237	B	20011001	TW 1995-84112588	19951125
WO 9631494	A1	19961010	WO 1996-US4464	19960401
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
WO 9631506	A1	19961010	WO 1996-US4465	19960401
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
AU 9653824	A1	19961023	AU 1996-53824	19960401
AU 9654386	A1	19961023	AU 1996-54386	19960401
EP 830358	A1	19980325	EP 1996-911521	19960401
R: BE, DE, ES, FR, GB, NL				
EP 836598	A1	19980422	EP 1996-910701	19960401
R: BE, DE, ES, FR, GB, NL				



CN 1186491	A	19980701	CN 1996-194404	19960401
CN 1186490	A	19980701	CN 1996-194422	19960401
JP 11503162	T2	19990323	JP 1996-530411	19960401
JP 11504622	T2	19990427	JP 1996-530412	19960401
BR 9604801	A	19991130	BR 1996-4801	19960401
US 5856523	A	19990105	US 1997-940592	19970930
BR 9608074	A	19991130	BR 1996-8074	19971002

## PRIORITY APPLN. INFO.:

US 1992-854559	A2	19920319
US 1993-128797	A2	19930929
US 1990-584126	A2	19900918
US 1990-584466	A2	19900918
US 1995-417597	A2	19950405
US 1995-473400	A	19950606
WO 1996-US4464	W	19960401
WO 1996-US4465	W	19960401

AB A **cyclic ester** composition containing  $\geq 1$  impurity is prepared and contacted with  $\geq 1$  adsorbent to remove the impurity and recover the purified **cyclic esters**. Specifically, lactide derivs. are purified by contact with ion-exchange resins to remove monomeric free acid and then with zeolites to remove water, improving their storage stability. The purified compns. are suitable for use in the manufacture of polymers having average d.p.  $>1700$ . Thus, 2-hydroxy-2-methylpropionic acid was dimerized to tetramethylglycolide (I) by heating in m-xylene in the presence of TsOH. An acetone solution of the crude I was neutralized and passed through a column containing Amberlyst A 21 to remove free acid, the effluent was evaporated to dryness, recrystd. from petroleum ether, and **polymerized** with tert-BuOLi for 8 h at  $130^\circ$  to give a polymer with weight-average mol. weight 520,000, vs. 17,200 when purification of

crude I was limited to recrystn.

IT 32474-74-1P 33135-50-1P, Poly-L-lactide  
 RL: PNU (Preparation, unclassified); PREP (Preparation)  
 (preparation and purification of **cyclic esters** for **polymerization**)

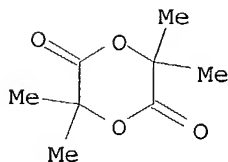
RN 32474-74-1 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,3,6,6-tetramethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 6713-72-0

CMF C8 H12 O4



RN 33135-50-1 CAPLUS

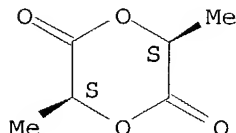
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C07D321-00

ICS C07D321-10

NCL 549274000

CC 35-2 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 28

ST **cyclic ester** purifn adsorption; lactide deriv purifn adsorption

IT Ion exchangers

Molecular sieves

(adsorbents; preparation and purification of **cyclic esters** for **polymerization**)

IT Clays, uses

RL: NUU (Other use, unclassified); USES (Uses)

(adsorbents; preparation and purification of **cyclic esters** for **polymerization**)

IT Polyesters, preparation

RL: PNU (Preparation, unclassified); **PREP (Preparation)**

(aliphatic; preparation and purification of **cyclic esters** for **polymerization**)

IT Packaging materials

(for purified **cyclic esters**)

IT Adsorbents

Anion exchangers

Silica gel adsorbents

(preparation and purification of **cyclic esters** for **polymerization**)

IT Lactones

RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT

(Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)

(preparation and purification of **cyclic esters** for **polymerization**)

IT Zeolite 3A

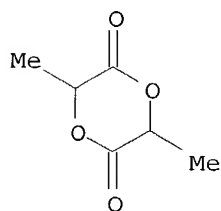
RL: NUU (Other use, unclassified); USES (Uses)

(preparation and purification of **cyclic esters** for **polymerization**)

- IT 7440-44-0, Carbon, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(activated, adsorbents; preparation and purification of **cyclic esters for polymerization**)
- IT 1344-28-1, Alumina, uses  
RL: NUU (Other use, unclassified); USES (Uses)  
(adsorbents; preparation and purification of **cyclic esters for polymerization**)
- IT 9002-88-4, Polyethylene  
RL: TEM (Technical or engineered material use); USES (Uses)  
(low-d., foil laminates; for packaging purified **cyclic esters**)
- IT 197568-82-4P  
RL: BYP (Byproduct); REM (Removal or disposal); PREP (Preparation)  
; PROC (Process)  
(preparation and purification of **cyclic esters for polymerization**)
- IT 164790-46-9P 197568-83-5P  
RL: IMF (Industrial manufacture); PUR (Purification or recovery);  
**PREP (Preparation)**  
(preparation and purification of **cyclic esters for polymerization**)
- IT 95-96-5P, Lactide 6713-72-0P, Tetramethylglycolide  
RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT  
(Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)  
(preparation and purification of **cyclic esters for polymerization**)
- IT 9017-40-7, Reillex 425 9049-93-8, Amberlyst A 21  
RL: NUU (Other use, unclassified); USES (Uses)  
(preparation and purification of **cyclic esters for polymerization**)
- IT 26161-42-2P 32126-30-0P, Tetramethylglycolide homopolymer, SRU  
32474-74-1P 33135-50-1P, Poly-L-lactide  
RL: PNU (Preparation, unclassified); **PREP (Preparation)**  
(preparation and purification of **cyclic esters for polymerization**)
- IT 4511-42-6P, L-Lactide  
RL: PUR (Purification or recovery); **PREP (Preparation)**  
(preparation and purification of **cyclic esters for polymerization**)
- IT 50-21-5, reactions 594-61-6, 2-Hydroxy-2-methylpropionic acid  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(preparation and purification of **cyclic esters for polymerization**)
- IT 617-73-2, 2-Hydroxyoctanoic acid  
RL: RCT (Reactant); REM (Removal or disposal); PROC (Process); RACT  
(Reactant or reagent)  
(preparation and purification of **cyclic esters for polymerization**)

L32 ANSWER 44 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1997:624211 CAPLUS

DOCUMENT NUMBER: 127:278478  
 TITLE: New initiators for the ring-opening  
**polymerization of cyclic  
 esters**  
 AUTHOR(S): Stevels, Willem M.; Dijkstra, Pieter J.; Feijen, Jan  
 CORPORATE SOURCE: Dep. Chem. Technol., Inst. Biomed. Technol., Univ.  
 Twente, Enschede, 7500 AE, Neth.  
 SOURCE: Trends in Polymer Science (Cambridge, United Kingdom)  
 (1997), 5(9), 300-305  
 CODEN: TPSCE8; ISSN: 0966-4793  
 PUBLISHER: Elsevier  
 DOCUMENT TYPE: Journal; General Review  
 LANGUAGE: English  
 AB A review with 39 refs. on lanthanide compound initiators for ring-opening  
**polymerization** of lactones, especially caprolactone and lactide. Polyesters  
 having controlled macromol. architecture have been prepared using these  
 initiators.  
 IT 26680-10-4P, Polylactide  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (preparation by ring-opening **polymerization** using lanthanide compound  
 initiators)  
 RN 26680-10-4 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 95-96-5  
 CMF C6 H8 O4



CC 35-0 (Chemistry of Synthetic High Polymers)  
 ST review lactone **polymn** lanthanide compd catalyst  
 IT Polyesters, preparation  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (lactone-based; preparation by ring-opening **polymerization** of lactones  
 using lanthanide compound initiators)  
 IT Lactones  
 RL: PRP (Properties); SPN (Synthetic preparation); PREP  
 (Preparation)  
 (polymers; preparation by ring-opening **polymerization** of lactones using  
 lanthanide compound initiators)

IT **Polymerization** catalysts  
 (ring-opening; lanthanide compound initiators for ring-opening  
**polymerization** of lactones)  
 IT 24980-41-4P, Polycaprolactone 25248-42-4P, Polycaprolactone  
 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] **26680-10-4P**  
 , Polylactide  
 RL: PRP (Properties); **SPN (Synthetic preparation); PREP**  
**(Preparation)**  
 (preparation by ring-opening **polymerization** using lanthanide compound  
 initiators)

L32 ANSWER 45 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
 ACCESSION NUMBER: 1997:571437 CAPLUS  
 DOCUMENT NUMBER: 127:162267  
 TITLE: Bioabsorptive polyester and its production method  
 INVENTOR(S): Funae, Akihiro; Morita, Kenji; Akieda, Hideyuki  
 PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan; Mitsui Chemicals  
 Inc.  
 SOURCE: Jpn. Kokai Tokkyo Koho, 6 pp.  
 CODEN: JKXXAF  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Japanese  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 09176295	A2	19970708	JP 1995-339039	19951226
JP 3487703	B2	20040119		

PRIORITY APPLN. INFO.: JP 1995-339039 19951226

OTHER SOURCE(S): MARPAT 127:162267

AB The title polyesters, useful for sutures, plates for bonesetting, etc.,  
 are prepared by ring-opening **polymerization** of **cyclic**  
**esters** using R1R2R3C6H3 (R1-2 = C1-3 alkyl, H, OH, OMe, OCOMe,  
 CO2H, CO2Me, CO2Et, NH2, NHMe, NMe2, NHCOMe; R3 = OH, CO2H) as initiators.  
 Glycolide and DL-lactide were copolymd. using acetylsalicylic acid as an  
 initiator.

IT **26780-50-7P**, Glycolide-DL-lactide copolymer  
 RL: **IMF (Industrial manufacture); PRP (Properties); PREP**  
**(Preparation)**  
 (bioabsorptive polyester and its production method)

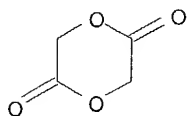
RN 26780-50-7 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione  
 (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

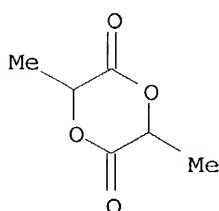
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



IC ICM C08G063-08  
ICS C08G063-20; C08G063-60; C08G063-685; C08G063-78  
CC 35-5 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 63  
ST bioabsorptive polyester **polymn** initiator; ring opening  
**polymn** initiator polyester; acetylsalicylic acid initiator  
**polymn**  
IT Polyesters, preparation  
RL: IMF (Industrial manufacture); PRP (Properties); **PREP**  
(Preparation)  
(bioabsorptive polyester and its production method)  
IT **Polymerization** catalysts  
(ring-opening; bioabsorptive polyester and its production method)  
IT 26780-50-7P, Glycolide-DL-lactide copolymer  
RL: IMF (Industrial manufacture); PRP (Properties); **PREP**  
(Preparation)  
(bioabsorptive polyester and its production method)  
IT 50-78-2, Acetyl salicylic acid 65-85-0, Benzoic acid, reactions  
69-72-7, Salicylic acid, reactions 103-90-2 108-95-2, Phenol,  
reactions 118-61-6, Ethyl salicylate  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(bioabsorptive polyester and its production method)

L32 ANSWER 46 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1997:496692 CAPLUS  
DOCUMENT NUMBER: 127:109358  
TITLE: Manufacture of microspheres and latexes of polyesters  
of low particle-size dispersity  
INVENTOR(S): Slomkowski, Stanislaw; Penczek, Stanislaw; Sosnowski,

Stanislaw  
 PATENT ASSIGNEE(S): PAN, Centrum Badan Molekularnych i Makromolekularnych,  
 Pol.  
 SOURCE: Pol., 6 pp.  
 CODEN: POXXA7  
 DOCUMENT TYPE: Patent  
 LANGUAGE: Polish  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PL 171136	B1	19970328	PL 1993-300020	19930810

PRIORITY APPLN. INFO.: PL 1993-300020 19930810

AB Microspheres and latexes of polyesters of low particle-size dispersity, useful as carriers for biol. active compds., are manufactured by polymn . of **cyclic esters** containing  $\geq 1$  ester group in the ring such as lactones and cyclic diesters in a mixture of aliphatic hydrocarbons and ethers in the presence of a surfactants based on block or graft copolymers of vinyl monomers and polyesters with mol.-weight polydispersity  $< 1.15$ . A typical graft copolymer surfactant was manufactured by reaction of  $\alpha$ -hydro- $\omega$ -hydroxypoly( $\epsilon$ -caprolactone) having mol.-weight polydispersity 1.1 with methacryloyl chloride, and **polymerization** of the intermediate with dodecyl acrylate.

IT 26680-10-4P, Poly(D,L-lactide) 33135-50-1P, Poly(L-lactide)  
 RL: IMF (Industrial manufacture); PREP (Preparation)  
 (manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)

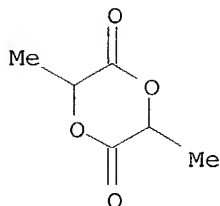
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



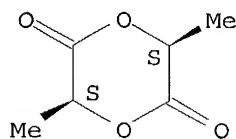
RN 33135-50-1 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6  
CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C08G063-08  
CC 35-5 (Chemistry of Synthetic High Polymers)  
ST polylactone latex low particle size dispersity; dodecyl acrylate caprolactone graft copolymer surfactant; biol active compd carrier polyester; microsphere polyester low particle size dispersity; cyclic diester polymer latex manuf  
IT Polyesters, preparation  
RL: IMF (Industrial manufacture); NUU (Other use, unclassified); **PREP (Preparation)**; USES (Uses)  
(acrylic, graft, surfactants; manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)  
IT Surfactants  
(block or graft acrylic-polyesters; manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)  
IT Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(lactone-based; manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)  
IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P, Poly[oxy(1-oxo-1,6-hexanediyl)] 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26161-42-2P **26680-10-4P**, Poly(D,L-lactide) 33135-50-1P, Poly(L-lactide)  
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**  
(manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)  
IT 112727-51-2P  
RL: IMF (Industrial manufacture); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)  
(surfactant precursor; manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)  
IT 160950-41-4P  
RL: IMF (Industrial manufacture); NUU (Other use, unclassified); **PREP (Preparation)**; USES (Uses)  
(surfactant; manufacture of microspheres and latexes of polyesters of low particle-size dispersity in presence of polymeric surfactants)

L32 ANSWER 47 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN



ACCESSION NUMBER: 1997:411973 CAPLUS  
 DOCUMENT NUMBER: 127:122057  
 TITLE: Synthesis of degradable crosslinked polymers based on  
 1,5-dioxepan-2-one and crosslinker of  
 bis- $\epsilon$ -caprolactone type  
 AUTHOR(S): Palmgren, Ronnie; Karlsson, Sigbritt; Albertsson,  
 Ann-Christine  
 CORPORATE SOURCE: Department Polymer Technology, Royal Institute  
 Technology (KTH), Stockholm, S-100 44, Swed.  
 SOURCE: Journal of Polymer Science, Part A: Polymer Chemistry  
 (1997), 35(9), 1635-1649  
 CODEN: JPACEC; ISSN: 0887-624X  
 PUBLISHER: Wiley  
 DOCUMENT TYPE: Journal  
 LANGUAGE: English

AB Poly(lactones) may be crosslinked by ring-opening polymerization of the  
 corresponding cyclic esters in the presence of  
 tetrafunctional bis( $\epsilon$ -caprolactone). The homopolymer of  
 1,5-dioxepan-2-one (DXO) has poor mech. properties but also some very good  
 properties, such as biocompatibility and degradability. Crosslinking of  
 degradable polymer based on DXO was performed with crosslinkers having the  
 same reactivity as the monomer. 2,2-Bis( $\epsilon$ -caprolacton-4-  
 yl)propane (BCP) and bis( $\epsilon$ -caprolacton-4-yl) (BCY) with  
 tetrafunctionalities were synthesized from the corresponding diols and  
 then used as comonomers during the polymerization of DXO. The  
 comonomers showed the same reactivity to the initiator, stannous  
 2-ethylhexanoate, as DXO and perfectly random crosslinked films were  
 obtained. The crosslinked films showed a high degree of swelling at 2-3  
 mol% BCP or BCY. The BCP crosslinker was somewhat less soluble in DXO at  
 lower temps., but all BCP was soluble at 180°C. These polymeric films  
 were elastic with no crystallinity and the Tg values increased from  
 -39°C for pure DXO to -35°C for BCP crosslinked films and  
 -21°C for BCY crosslinked ones.

IT 192801-76-6P 192801-77-7P

RL: SPN (Synthetic preparation); PREP (Preparation)  
 (synthesis of degradable crosslinked polyesters based on  
 1,5-dioxepan-2-one and crosslinker of bis- $\epsilon$ -caprolactone type)

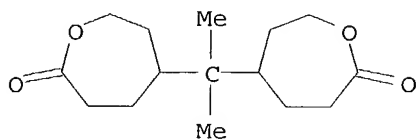
RN 192801-76-6 CAPLUS

CN 1,4-Dioxepan-5-one, polymer with 5,5'-(1-methylethylidene)bis[2-oxepanone]  
 (9CI) (CA INDEX NAME)

CM 1

CRN 93745-78-9

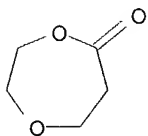
CMF C15 H24 O4



CM 2

CRN 35438-57-4

CMF C5 H8 O3



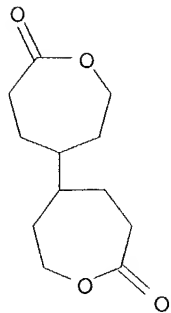
RN 192801-77-7 CAPLUS

CN [4,4'-Bioxepane]-7,7'-dione, polymer with 1,4-dioxepan-5-one (9CI) (CA INDEX NAME)

CM 1

CRN 179523-43-4

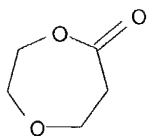
CMF C12 H18 O4



CM 2

CRN 35438-57-4

CMF C5 H8 O3



- CC 35-5 (Chemistry of Synthetic High Polymers)  
Section cross-reference(s): 37
- ST dioxepanone polyester crosslinking agent; caprolactonylpropane crosslinker  
dioxepanone polymer; biscaprolactonyl crosslinker dioxepanone polymer
- IT Glass transition temperature  
(glass temperature of degradable crosslinked polyesters based on  
1,5-dioxepan-2-one and crosslinker of bis- $\epsilon$ -caprolactone type)
- IT Crosslinking agents  
(synthesis of degradable crosslinked polyesters based on  
1,5-dioxepan-2-one and crosslinker of bis- $\epsilon$ -caprolactone type)
- IT Polyesters, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(synthesis of degradable crosslinked polyesters based on  
1,5-dioxepan-2-one and crosslinker of bis- $\epsilon$ -caprolactone type)
- IT 93745-78-9P 179523-43-4P, [4,4'-Bioxepane]-7,7'-dione  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)  
(crosslinker; synthesis of degradable crosslinked polyesters based on  
1,5-dioxepan-2-one and crosslinker of bis- $\epsilon$ -caprolactone type)
- IT 7418-16-8P, 2,2-Bis(4-oxocyclohexyl)propane  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)  
(intermediate for crosslinker; synthesis of degradable crosslinked  
polyesters based on 1,5-dioxepan-2-one and crosslinker of  
bis- $\epsilon$ -caprolactone type)
- IT 35438-57-4P, 1,4-Dioxepan-5-one  
RL: RCT (Reactant); SPN (Synthetic preparation); **PREP (Preparation)**; RACT (Reactant or reagent)  
(monomer; synthesis of degradable crosslinked polyesters based on  
1,5-dioxepan-2-one and crosslinker of bis- $\epsilon$ -caprolactone type)
- IT 80-04-6, 2,2-Bis(4-hydroxycyclohexyl)propane 20601-38-1,  
[1,1'-Bicyclohexyl]-4,4'-diol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material for crosslinker; synthesis of degradable crosslinked  
polyesters based on 1,5-dioxepan-2-one and crosslinker of  
bis- $\epsilon$ -caprolactone type)
- IT 29943-42-8, Tetrahydro-4H-pyran-4-one  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(starting material for monomer; synthesis of degradable crosslinked  
polyesters based on 1,5-dioxepan-2-one and crosslinker of  
bis- $\epsilon$ -caprolactone type)
- IT 192801-76-6P 192801-77-7P  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(synthesis of degradable crosslinked polyesters based on

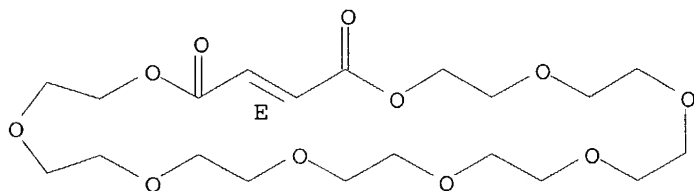
1,5-dioxepan-2-one and crosslinker of bis-ε-caprolactone type)

L32 ANSWER 48 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1997:224172 CAPLUS  
DOCUMENT NUMBER: 126:251893  
TITLE: New type of crosslinking agents for vinyl polymers  
AUTHOR(S): Zada, Anat; Avny, Yair; Zilkha, Albert  
CORPORATE SOURCE: Dep. Org. Chem., Hebrew Univ., Jerusalem, 91904,  
Israel  
SOURCE: Polymer Preprints (American Chemical Society, Division  
of Polymer Chemistry) (1997), 38(1), 145-146  
CODEN: ACPPAY; ISSN: 0032-3934  
PUBLISHER: American Chemical Society, Division of Polymer  
Chemistry  
DOCUMENT TYPE: Journal  
LANGUAGE: English  
AB Cyclic octaethylene glycol fumarate was prepared from fumaryl chloride and  
octaethylene glycol and **polymerized** to give a soft polymer soluble in  
various solvents. **Copolymn.** of the **cyclic**  
**ester** with styrene or Me methacrylate gave insol. crosslinked  
polymers that swelled in various solvents.  
IT 188650-35-3P 188650-36-4P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of crosslinked)  
RN 188650-35-3 CAPLUS  
CN 1,4,7,10,13,16,19,22,25-Nonaoxacyclononacos-27-ene-26,29-dione, (27E)-,  
polymer with ethenylbenzene (9CI) (CA INDEX NAME)

CM 1

CRN 188650-33-1  
CMF C20 H34 O11

Double bond geometry as shown.



CM 2

CRN 100-42-5  
CMF C8 H8

$\text{H}_2\text{C}=\text{CH}-\text{Ph}$

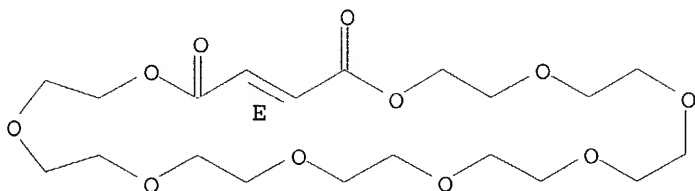
RN 188650-36-4 CAPLUS  
CN 2-Propenoic acid, 2-methyl-, methyl ester, polymer with  
(27E)-1,4,7,10,13,16,19,22,25-nonaoxacyclononacos-27-ene-26,29-dione (9CI)  
(CA INDEX NAME)

CM 1

CRN 188650-33-1

CMF C20 H34 O11

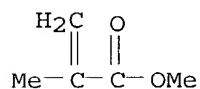
Double bond geometry as shown.



CM 2

CRN 80-62-6

CMF C5 H8 O2



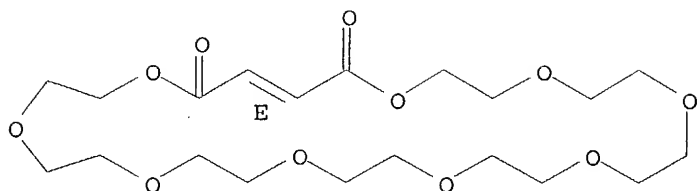
IT 188650-34-2P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of soft)  
RN 188650-34-2 CAPLUS  
CN 1,4,7,10,13,16,19,22,25-Nonaoxacyclononacos-27-ene-26,29-dione, (27E)-,  
homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 188650-33-1

CMF C20 H34 O11

Double bond geometry as shown.



CC 37-6 (Plastics Manufacture and Processing)  
Section cross-reference(s): 35

ST cyclic octaethylene glycol fumarate prepn **polymn**; crosslinker  
cyclic octaethylene glycol fumarate; styrene copolymer cyclic octaethylene  
glycol fumarate; methacrylate copolymer cyclic octaethylene glycol  
fumarate

IT Crosslinking agents  
(preparation of cyclic octaethylene glycol fumarate as crosslinking agents  
for vinyl polymers)

IT 627-63-4, Fumaryl chloride 5117-19-1, Octaethylene glycol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(in preparation of cyclic octaethylene glycol fumarate as crosslinking  
agents for vinyl polymers)

IT 188650-35-3P 188650-36-4P  
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**  
(preparation of crosslinked)

IT 188650-33-1P  
RL: MOA (Modifier or additive use); RCT (Reactant); SPN (Synthetic  
preparation); **PREP (Preparation)**; RACT (Reactant or reagent);  
USES (Uses)  
(preparation of cyclic octaethylene glycol fumarate as crosslinking agents  
for vinyl polymers)

IT 188650-34-2P  
RL: **SPN (Synthetic preparation)**; **PREP (Preparation)**  
(preparation of soft)

L32 ANSWER 49 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1997:177090 CAPLUS

DOCUMENT NUMBER: 126:171929

TITLE: Macromolecular engineering of polylactones and  
polylactides by ring-opening **polymerization**

AUTHOR(S): Dubois, Philippe; Degee, Philippe; Ropson, Nathalie;  
Jerome, Robert

CORPORATE SOURCE: University of Liege, Liege, Belg.

SOURCE: Plastics Engineering (New York) (1997),  
40(Macromolecular Design of Polymeric Materials),  
247-272  
CODEN: PLENEZ; ISSN: 1040-2527

PUBLISHER: Dekker

DOCUMENT TYPE: Journal; General Review

LANGUAGE: English

AB Recent advances in the ring-opening **polymerization** of cyclic  
(di)**esters** initiated with aluminum alkoxides are reviewed with

67 refs. with emphasis on the controlled synthesis of high-mol-weight poly( $\epsilon$ -caprolactone) and polylactide initiated by aluminum isopropoxide and the macromol. engineering of aliphatic polyesters.

IT 26680-10-4P, Polylactide

RL: SPN (Synthetic preparation); PREP (Preparation)

(macromol. engineering of polylactones and polylactides by ring-opening polymerization)

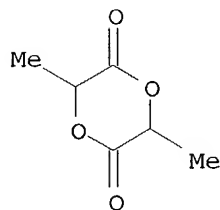
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-0 (Chemistry of Synthetic High Polymers)

ST review ring opening **polymn** cyclic ester;  
lactone ring opening **polymn** review; lactide ring opening  
**polymn** review

IT Polyesters, preparation

RL: SPN (Synthetic preparation); PREP (Preparation)

(aliphatic; in macromol. engineering of polylactones and polylactides by ring-opening polymerization)

IT Polymerization

(ring-opening; macromol. engineering of polylactones and polylactides by)

IT 555-31-7, Aluminum isopropoxide

RL: CAT (Catalyst use); USES (Uses)

(catalyst; in macromol. engineering of polylactones and polylactides by ring-opening polymerization)

IT 24980-41-4P, Poly( $\epsilon$ -caprolactone) 25248-42-4P,

Poly[oxy(1-oxo-1,6-hexanediyl)] 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P, Polylactide

RL: SPN (Synthetic preparation); PREP (Preparation)

(macromol. engineering of polylactones and polylactides by ring-opening polymerization)

L32 ANSWER 50 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:733944 CAPLUS

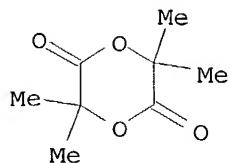
DOCUMENT NUMBER: 126:8817

TITLE: Method to produce and purify **cyclic esters**

INVENTOR(S): Eggeman, Timothy J.; Benecke, Herman P.  
 PATENT ASSIGNEE(S): Chronopol, Inc., USA  
 SOURCE: PCT Int. Appl., 79 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 17  
 PATENT INFORMATION:

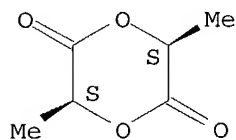
PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9631506	A1	19961010	WO 1996-US4465	19960401
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
US 5675021	A	19971007	US 1995-417597	19950405
AU 9654386	A1	19961023	AU 1996-54386	19960401
EP 830358	A1	19980325	EP 1996-911521	19960401
R: BE, DE, ES, FR, GB, NL				
JP 11504622	T2	19990427	JP 1996-530412	19960401
BR 9604801	A	19991130	BR 1996-4801	19960401
BR 9608074	A	19991130	BR 1996-8074	19971002
PRIORITY APPLN. INFO.:			US 1995-417597	A 19950405
			US 1992-854559	A2 19920319
			US 1993-128797	A2 19930929
			US 1995-473400	A 19950606
			WO 1996-US4465	W 19960401
AB	Feed streams of <b>cyclic esters</b> are manufactured by dewatering feed streams containing $\geq 1$ of a hydroxy carboxylic acid or its ester, salt, or amide, and dimers, trimers, tetramers, and pentamers of these compds. so that the product contains <20% pentamers and higher oligomers. These <b>cyclic ester</b> -containing feed streams are treated with adsorbents that do not degrade the <b>cyclic ester</b> in $\geq 1$ step to remove water and(or) free acid. Highly pure <b>cyclic esters</b> are manufactured and are are <b>polymerizable</b> to give polymers having an average d.p. >1700.			
IT	32474-74-1P, Poly(tetramethylglycolide) 33135-50-1P, L-Lactide polymer			
	RL: IMF (Industrial manufacture); PREP (Preparation) (manufacture, purification (using adsorbents), and polymerization of <b>cyclic esters</b> of hydroxy acids)			
RN	32474-74-1 CAPLUS			
CN	1,4-Dioxane-2,5-dione, 3,3,6,6-tetramethyl-, homopolymer (9CI) (CA INDEX NAME)			
CM	1			
CRN	6713-72-0			
CMF	C8 H12 O4			





RN 33135-50-1 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA  
 INDEX NAME)  
 CM 1  
 CRN 4511-42-6  
 CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C07D407-00  
 ICS C07D321-00; C08L001-00; C08F020-00  
 CC 35-5 (Chemistry of Synthetic High Polymers)  
 ST **cyclic ester** hydroxy acid manuf; polyester manuf  
**cyclic ester** based; lactone manuf hydroxy acid;  
 adsorbent purifn **cyclic ester**  
 IT Anion exchangers  
 Molecular sieves  
 (adsorbent; manufacture, purification (using adsorbents), and **polymerization**  
 of **cyclic esters** of hydroxy acids)  
 IT Clays, uses  
 Silica gel, uses  
 RL: NUU (Other use, unclassified); USES (Uses)  
 (adsorbent; manufacture, purification (using adsorbents), and **polymerization**  
 of **cyclic esters** of hydroxy acids)  
 IT Carboxylic acids, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (hydroxy, salts; manufacture, purification (using adsorbents), and **polymn**  
 of **cyclic esters** of hydroxy acids)  
 IT Amides, reactions  
 Carboxylic acids, reactions  
 Esters, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (hydroxy; manufacture, purification (using adsorbents), and **polymerization**  
 of

- cyclic esters of hydroxy acids)**
- IT Adsorbents  
(manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT Lactones  
RL: IMF (Industrial manufacture); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)  
(manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT 7440-44-0, Carbon, uses  
RL: NUU (Other use, unclassified); **USES (Uses)**  
(activated, adsorbent; manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT 1344-28-1, Alumina, uses 9003-55-8D, Butadiene-styrene copolymer, tertiary amine derivs. 9017-40-7, Reillex 425 9049-93-8, Amberlyst A-21  
RL: NUU (Other use, unclassified); **USES (Uses)**  
(adsorbent; manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT 79-14-1DP, Glycolic acid, cyclic lactone derivs. 87-69-4DP, Tartaric acid, cyclic lactone derivs., preparation 90-64-2DP, Mandelic acid, cyclic lactone derivs. 95-96-5P, Lactide 515-30-0DP, 2-Hydroxy-2-phenylpropionic acid, cyclic lactone derivs. 600-15-7DP, 2-Hydroxybutanoic acid, cyclic lactone derivs. 617-31-2DP, 2-Hydroxypentanoic acid, cyclic lactone derivs. 1123-28-0DP, 1-Hydroxy-1-cyclohexanecarboxylic acid, cyclic lactone derivs. 3739-30-8DP, 2-Hydroxy-2-methylbutanoic acid, cyclic lactone derivs. 6064-63-7DP, 2-Hydroxycaproic acid, cyclic lactone derivs. 6915-15-7DP, Malic acid, cyclic lactone derivs. 19377-73-2DP, 2-Hydroxy-2-(2-furanyl) ethanoic acid, cyclic lactone derivs. 26161-42-2P, Poly(L-Lactide), sru 32126-30-0P **32474-74-1P**, Poly(tetramethylglycolide) **33135-50-1P**, L-Lactide polymer 152998-36-2DP, 2-Hydroxy-2-(2-tetrahydrofuranyl) ethanoic acid, cyclic lactone derivs. 164790-46-9P  
RL: **IMF (Industrial manufacture)**; **PREP (Preparation)**  
(manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT 4511-42-6P, L-Lactide 6713-72-0P, Tetramethylglycolide  
RL: IMF (Industrial manufacture); RCT (Reactant); **PREP (Preparation)**; RACT (Reactant or reagent)  
(manufacture, purification (using adsorbents), and **polymerization of cyclic esters of hydroxy acids)**
- IT 50-21-5, Lactic acid, reactions 79-14-1, Glycolic acid, reactions 79-33-4, L-Lactic acid, reactions 87-69-4, Tartaric acid, reactions 90-64-2, Mandelic acid 515-30-0, 2-Hydroxy-2-phenylpropionic acid 594-61-6, 2-Hydroxy-2-methylpropionic acid 600-15-7, 2-Hydroxybutanoic acid 617-31-2, 2-Hydroxypentanoic acid 617-73-2, 2-Hydroxyoctanoic acid 1123-28-0, 1-Hydroxy-1-cyclohexanecarboxylic acid 3739-30-8,

2-Hydroxy-2-methylbutanoic acid 6064-63-7, 2-Hydroxycaproic acid  
 6915-15-7, Malic acid 19377-73-2, 2-Hydroxy-2-(2-furanyl)ethanoic acid  
 152998-36-2, 2-Hydroxy-2-(2-tetrahydrofuran-2-yl)ethanoic acid  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (manufacture, purification (using adsorbents), and **polymerization of  
 cyclic esters** of hydroxy acids)

L32 ANSWER 51 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1996:724174 CAPLUS  
 DOCUMENT NUMBER: 125:329830  
 TITLE: Manufacture and purification of **cyclic  
 esters**  
 INVENTOR(S): Miao, Fudu; Eggeman, Timothy J.  
 PATENT ASSIGNEE(S): Chronopol, Inc., USA  
 SOURCE: PCT Int. Appl., 80 pp.  
 CODEN: PIXXD2  
 DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 17  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
WO 9631494	A1	19961010	WO 1996-US4464	19960401
W: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI				
RW: KE, LS, MW, SD, SZ, UG, AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, BF, BJ, CF, CG, CI, CM, GA, GN, ML				
US 5675021	A	19971007	US 1995-417597	19950405
US 5686630	A	19971111	US 1995-473400	19950606
AU 9653824	A1	19961023	AU 1996-53824	19960401
EP 836598	A1	19980422	EP 1996-910701	19960401
R: BE, DE, ES, FR, GB, NL				
JP 11503162	T2	19990323	JP 1996-530411	19960401
PRIORITY APPLN. INFO.:			US 1995-417597	A 19950405
			US 1995-473400	A 19950606
			US 1992-854559	A2 19920319
			US 1993-128797	A2 19930929
			WO 1996-US4464	W 19960401

AB **Cyclic esters**, prepared from hydroxy carboxylic acids or their esters, salts, or amides, are purified by by adsorption of impurities from solvents containing the **cyclic esters** or by adding <3% aqueous solvent into a **cyclic ester**-containing composition and allowing two phases to form. A first phase includes **cyclic esters** and any organic solvent, and a second phase includes the aqueous solvent and impurities. Optionally, the first phase is an adsorbent to remove impurities. The purified **cyclic esters** are useful for manufacture of polyesters. Thus, cyclizing 2-hydroxy-2-methylpropionic acid in m-xylene in the presence of p-toluenesulfonic acid, washing the crude product with Na<sub>2</sub>CO<sub>3</sub>,

neutralizing, drying, dissolving in Me<sub>2</sub>CO, passing the Me<sub>2</sub>CO solution through an Amberlyst A-21 column, evaporating the column effluent to dryness, recrystg. the resulting solid from petroleum ether, and **polymerizing** the purified tetramethylglycolide in the presence of Li tert-butoxide 8 h at 130° gave polymer with weight-average mol. weight 520,000.

IT 32474-74-1P, Poly(tetramethylglycolide) 33135-50-1P,

L-Lactide homopolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(manufacture and purification and **polymerization of cyclic esters**)

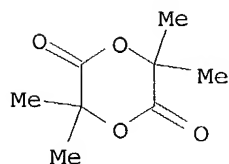
RN 32474-74-1 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,3,6,6-tetramethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 6713-72-0

CMF C8 H12 O4



RN 33135-50-1 CAPLUS

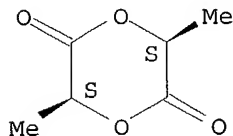
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C07D307-94

ICS C07D311-96; C07D313-06; C07D313-16; C07D319-00; C07D319-12; C07D407-00; C08F020-00

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 27

ST purifn **cyclic ester**; polyester manuf **cyclic ester** monomer; tetramethylglycolide purifn **polymn**

- IT Polyesters, preparation  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manufacture and purification and polymerization of cyclic esters)
- IT Lactones  
RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(manufacture and purification and polymerization of cyclic esters)
- IT 79-33-4, L-Lactic acid, reactions 594-61-6, 2-Hydroxy-2-methylpropionic acid 617-73-2, 2-Hydroxyoctanoic acid  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(cyclic ester precursor; manufacture and purification and polymerization of cyclic esters)
- IT 26161-42-2P, L-Lactide homopolymer, sru 32126-30-0P 32474-74-1P, Poly(tetramethylglycolide) 33135-50-1P, L-Lactide homopolymer  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manufacture and purification and polymerization of cyclic esters)
- IT 164790-46-9P  
RL: IMF (Industrial manufacture); PUR (Purification or recovery); PREP (Preparation)  
(manufacture and purification and polymerization of cyclic esters)
- IT 95-96-5P, Lactide 4511-42-6P, L-Lactide 6713-72-0P, Tetramethylglycolide  
RL: IMF (Industrial manufacture); PUR (Purification or recovery); RCT (Reactant); PREP (Preparation); RACT (Reactant or reagent)  
(manufacture and purification and polymerization of cyclic esters)
- L32 ANSWER 52 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1996:531647 CAPLUS  
DOCUMENT NUMBER: 125:168724  
TITLE: Evidence for Ester-Exchange Reactions and Cyclic Oligomers Formation in the Ring-Opening Polymerization of Lactide with Aluminum Complex Initiators  
AUTHOR(S): Montaudo, Giorgio; Montaudo, Maurizio S.; Puglisi, Concetto; Samperi, and Filippo; Spassky, N.; LeBorgne, Alain; Wisniewski, Muriel  
CORPORATE SOURCE: Dipartimento di Scienze Chimiche, Universita' di Catania, Catania, 6-95125, Italy  
SOURCE: Macromolecules (1996), 29(20), 6461-6465  
CODEN: MAMOBX; ISSN: 0024-9297  
PUBLISHER: American Chemical Society  
DOCUMENT TYPE: Journal  
LANGUAGE: English
- AB Four polylactide samples, obtained by ring-opening polymerization with an Al alkoxide initiator derived from a Schiff's base, were characterized by MALDI-TOF mass spectrometry. The MALDI mass spectra of these polylactides show well-resolved signals that can be reliably assigned to

polylactide oligomers. Remarkably, both even-membered and odd-membered oligomers are present in these MALDI spectra. The presence of odd-membered oligomers cannot be explained on the basis of the lactide ring-opening **polymerization**, and one must admit that **ester-exchange** reactions do occur parallel to the **polymerization** process, causing a random cleavage of the polylactide chain. Furthermore, evidence for the presence of cyclic lactides was found in the MALDI-TOF spectrum of a low mol. weight polylactide fraction, indicating that ester exchange occurs also in polylactides by intramol. end-biting reactions (ring-chain equilibration), with formation of cyclic oligomers.

IT 26680-10-4P, Polylactide

RL: PEP (Physical, engineering or chemical process); **SPN (Synthetic preparation)**; **PREP (Preparation)**; PROC (Process)  
(**ester-exchange** reactions and **cyclic** oligomer formation in ring-opening **polymerization** of lactide with aluminum complex initiators)

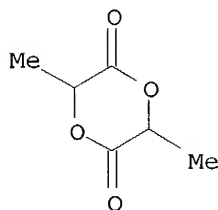
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



CC 35-3 (Chemistry of Synthetic High Polymers)

ST **ester** exchange ring opening **polymn** lactide

IT **Polymerization** catalysts

(**ester-exchange** reactions and **cyclic** oligomer formation in ring-opening **polymerization** of lactide with aluminum complex initiators)

IT Polyesters, preparation

RL: PEP (Physical, engineering or chemical process); **SPN (Synthetic preparation)**; **PREP (Preparation)**; PROC (Process)  
(lactide, **ester-exchange** reactions and **cyclic** oligomer formation in ring-opening **polymerization** of lactide with aluminum complex initiators)

IT **Polymerization**

(ring-opening, **ester-exchange** reactions and **cyclic** oligomer formation in ring-opening **polymerization** of lactide with aluminum complex initiators)

IT 157078-46-1, [2,2'-[Ethylenebis(nitrilomethylidene)]diphenolate]aluminum methoxide

RL: CAT (Catalyst use); USES (Uses)  
(**ester**-exchange reactions and **cyclic** oligomer  
formation in ring-opening **polymerization** of lactide with aluminum  
complex initiators)

IT 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-ethanediyl)] 26680-10-4P  
, Polylactide

RL: PEP (Physical, engineering or chemical process); SPN (**Synthetic  
preparation**); PREP (**Preparation**); PROC (Process)  
(**ester**-exchange reactions and **cyclic** oligomer  
formation in ring-opening **polymerization** of lactide with aluminum  
complex initiators)

L32 ANSWER 53 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:715696 CAPLUS

DOCUMENT NUMBER: 123:112953

TITLE: Copolymerization of 2,2-dimethyltrimethylene carbonate  
and **cyclic esters**

AUTHOR(S): Keul, Helmut; Schmidt, Peter; Robertz, Bernd; Hoecker,  
Hartwig

CORPORATE SOURCE: Rheinisch-Westfaelischen Technischen Hochschule  
Aschen, Aachen, 52056, Germany

SOURCE: Macromolecular Symposia (1995), 95(Synthesis of  
Controlled Polymeric Structures through Living  
Polymerizations and Related Processes), 243-53  
CODEN: MSYMEC; ISSN: 1022-1360

PUBLISHER: Huethig & Wepf

DOCUMENT TYPE: Journal

LANGUAGE: English

AB The anionic and/or insertion copolymn. of 2,2-dimethyltrimethylene  
carbonate (DTC) with  $\epsilon$ -caprolactone (ECL), pivalolactone (PVL) and  
L-lactide (LLA) is presented with special emphasis on the copolymn.  
mechanism. Statistical copolymers are obtained by copolymn. of DTC with  
ECL and with LLA, while with PVL a block copolymer is obtained. The role  
of transesterification on the microstructure is discussed.

IT 148851-29-0P, 2,2-Dimethyltrimethylene carbonate-L-lactide  
copolymer

RL: SPN (**Synthetic preparation**); PREP (**Preparation**)  
(copolymn. of 2,2-dimethyltrimethylene carbonate and **cyclic  
esters**)

RN 148851-29-0 CAPLUS

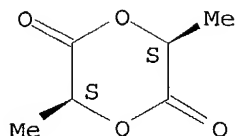
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
5,5-dimethyl-1,3-dioxan-2-one (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

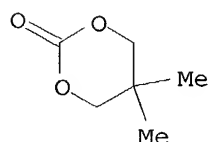
Absolute stereochemistry.



CM 2

CRN 3592-12-9

CMF C6 H10 O3



- CC 35-5 (Chemistry of Synthetic High Polymers)
- ST **copolymer** dimethyltrimethylene carbonate **cyclic ester**; microstructure polycarbonate polyester block; insertion transesterification **polymer** mechanism
- IT Chains, chemical  
(copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT **Polymerization**  
(insertion; copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT **Polymerization**  
(anionic, copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT Polyesters, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(polycarbonate-, copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT Polyesters, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(polycarbonate-, block, copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT Polycarbonates, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(polyester-, copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT Polycarbonates, preparation  
RL: SPN (Synthetic preparation); **PREP (Preparation)**  
(polyester-, block, copolymer. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)
- IT 502-44-3, ε-Caprolactone 1955-45-9, Pivalolactone 3592-12-9,



2,2-Dimethyltrimethylene carbonate 4511-42-6, L-Lactide 29035-04-9,  
 $\epsilon$ -Caprolactone-2,2-Dimethyltrimethylene carbonate copolymer

RL: RCT (Reactant); RACT (Reactant or reagent)

(copolymn. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)

IT 130055-00-4P, 2,2-Dimethyltrimethylene carbonate-pivalolactone block  
 copolymer **148851-29-0P**, 2,2-Dimethyltrimethylene  
 carbonate-L-lactide copolymer

RL: **SPN (Synthetic preparation); PREP (Preparation)**

(copolymn. of 2,2-dimethyltrimethylene carbonate and **cyclic esters**)

L32 ANSWER 54 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:689910 CAPLUS

DOCUMENT NUMBER: 123:56953

TITLE: Manufacture of biodegradable polyesters

INVENTOR(S): Takada, Morio; Kakizawa, Yasutoshi

PATENT ASSIGNEE(S): Dainippon Ink & Chemicals, Japan

SOURCE: Jpn. Kokai Tokkyo Koho, 15 pp.

CODEN: JKXXAF

DOCUMENT TYPE: Patent

LANGUAGE: Japanese

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
JP 07026001	A2	19950127	JP 1993-171517	19930712
JP 3309502	B2	20020729		
US 5484882	A	19960116	US 1994-272191	19940708

PRIORITY APPLN. INFO.: JP 1993-171517 A 19930712

AB Biodegradable polyesters are manufactured by ring-opening **polymerization** of  
 dimeric **cyclic esters** of hydroxycarboxylic acids  
 and/or lactones, optionally in the presence of other polyester-forming  
 monomers or polyesters; the manufacturing method is characterized by using a  
**polymerization** reactor equipped with a static mixer. Thus L-dilactide  
 and  $\epsilon$ -caprolactone were **polymerized**

IT **65408-67-5P**,  $\epsilon$ -Caprolactone-L-lactide copolymer  
**153116-63-3P 165181-59-9P 165181-60-2P**  
**165181-61-3P 165181-62-4P**

RL: **IMF (Industrial manufacture); PREP (Preparation)**  
 (manufacture of biodegradable polyesters)

RN 65408-67-5 CAPLUS

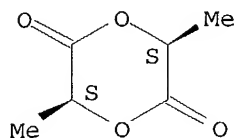
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone  
 (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

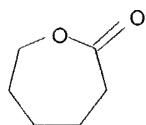
Absolute stereochemistry.



CM 2

CRN 502-44-3

CMF C6 H10 O2



RN 153116-63-3 CAPLUS

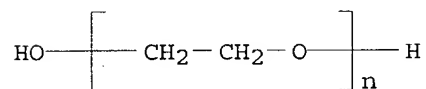
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
 $\alpha$ -hydro- $\omega$ -hydroxypoly(oxy-1,2-ethanediyl) (9CI) (CA INDEX  
 NAME)

CM 1

CRN 25322-68-3

CMF (C2 H4 O)<sub>n</sub> H2 O

CCI PMS

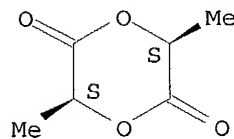


CM 2

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



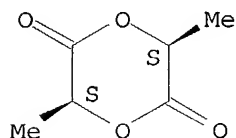
RN 165181-59-9 CAPLUS  
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S-cis)-, polymer with  
3,4-dihydro-2H-1-benzopyran-2-one (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

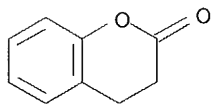
Absolute stereochemistry.



CM 2

CRN 119-84-6

CMF C9 H8 O2



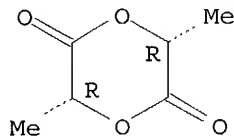
RN 165181-60-2 CAPLUS  
CN Butanedioic acid, polymer with (3R-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione, (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and 1,2-ethanediol  
(9CI) (CA INDEX NAME)

CM 1

CRN 13076-17-0

CMF C6 H8 O4

Absolute stereochemistry.

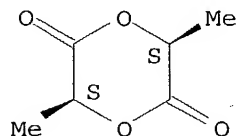


CM 2

CRN 4511-42-6

CMF C6 H8 O4

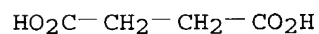
Absolute stereochemistry.



CM 3

CRN 110-15-6

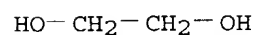
CMF C4 H6 O4



CM 4

CRN 107-21-1

CMF C2 H6 O2



RN 165181-61-3 CAPLUS

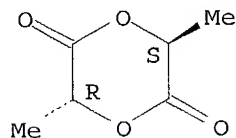
CN 1,4-Benzenedicarboxylic acid, polymer with trans-3,6-dimethyl-1,4-dioxane-2,5-dione, (3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and 1,2-ethanediol (9CI) (CA INDEX NAME)

CM 1

CRN 13076-19-2

CMF C6 H8 O4

Relative stereochemistry.

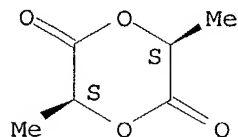


CM 2

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



CM 3

CRN 107-21-1

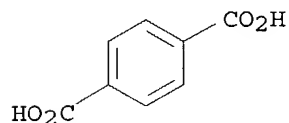
CMF C2 H6 O2

HO-CH<sub>2</sub>-CH<sub>2</sub>-OH

CM 4

CRN 100-21-0

CMF C8 H6 O4



RN 165181-62-4 CAPLUS

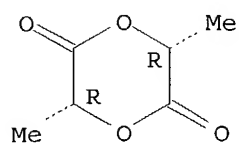
CN 1,3-Benzenedicarboxylic acid, polymer with 1,4-benzenedicarboxylic acid, (3R,6R)-3,6-dimethyl-1,4-dioxane-2,5-dione, (3S,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione, 2,2-dimethyl-1,3-propanediol, 1,2-ethanediol and hexanedioic acid (9CI) (CA INDEX NAME)

CM 1

CRN 13076-17-0

CMF C6 H8 O4

Absolute stereochemistry.

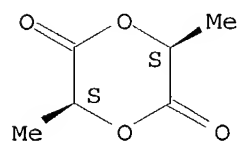


CM 2

CRN 4511-42-6

CMF C6 H8 O4

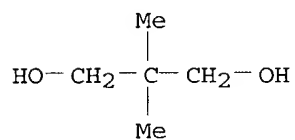
Absolute stereochemistry.



CM 3

CRN 126-30-7

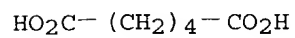
CMF C5 H12 O2



CM 4

CRN 124-04-9

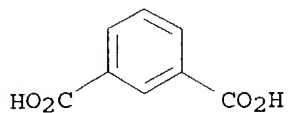
CMF C6 H10 O4



CM 5

CRN 121-91-5

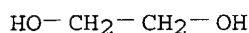
CMF C8 H6 O4



CM 6

CRN 107-21-1

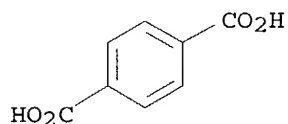
CMF C2 H6 O2



CM 7

CRN 100-21-0

CMF C8 H6 O4



IC ICM C08G063-78  
ICS C08G063-08  
CC 35-7 (Chemistry of Synthetic High Polymers)  
ST polyester biodegradable manuf; **polymn** app static mixer  
IT Biodegradable materials  
(manufacture of biodegradable polyesters)  
IT Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(manufacture of biodegradable polyesters)  
IT **Polymerization**  
(apparatus, manufacture of biodegradable polyesters)  
IT Mixing apparatus  
(static, manufacture of biodegradable polyesters)  
IT 29612-36-0P,  $\epsilon$ -Caprolactone- $\delta$ -valerolactone copolymer  
65408-67-5P,  $\epsilon$ -Caprolactone-L-lactide copolymer  
153116-63-3P 165181-59-9P 165181-60-2P  
165181-61-3P 165181-62-4P  
RL: **IMF (Industrial manufacture); PREP (Preparation)**  
(manufacture of biodegradable polyesters)

L32 ANSWER 55 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1995:538357 CAPLUS

DOCUMENT NUMBER: 122:266384  
 TITLE: Process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids  
 INVENTOR(S): Rafler, Gerald; Dahlmann, Juergen  
 PATENT ASSIGNEE(S): Fraunhofer-Gesellschaft zur Foerderung der Angewandten Forschung EV, Germany  
 SOURCE: Ger. Offen., 4 pp.  
 CODEN: GWXXBX  
 DOCUMENT TYPE: Patent  
 LANGUAGE: German  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
DE 4318204	A1	19941208	DE 1993-4318204	19930601
DE 4318204	C2	19980115		

PRIORITY APPLN. INFO.: DE 1993-4318204 19930601

AB The title polymers are prepared by catalytic ring-opening **polymerization** of **cyclic esters** at 60-180° in the melt, in the presence of anhydrous Zr(IV) compound, e.g., Zr tetrakis(acetylacetonate) (I). The **cyclic ester** monomers can be subjected to a pretreatment with an organosilicon compound, e.g., (Me<sub>3</sub>Si)<sub>2</sub>NH, to remove OH-containing impurities. Thus, heating 14.4 g D,L-lactide for 0.5 h at 150° with 0.244 g I under inert gas atmospheric gave the appropriate polylactide (mol. weight 51,400 g/mol) in 85% yield.

IT 26680-10-4P, Poly-D,L-lactide 26780-50-7P, Glycolide-DL-lactide copolymer 33135-50-1P, Poly-L-lactide

RL: IMF (Industrial manufacture); PREP (Preparation)

(process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)

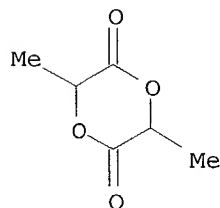
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



RN 26780-50-7 CAPLUS

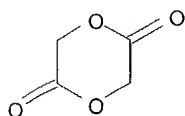
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)



CM 1

CRN 502-97-6

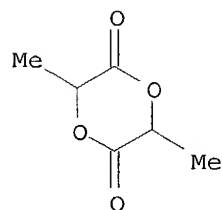
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



RN 33135-50-1 CAPLUS

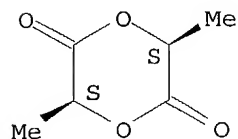
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C08G063-08

ICS C08G063-85

ICA A61F002-02; A61F002-28

CC 35-5 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 67

- ST polylactide; lactide **polymn** zirconium compd catalyst; zirconium tetrakisacetylacetonate catalyst lactide **polymn**; acetylacetonate zirconium catalyst lactide **polymn**; hydroxycarboxylate **polymn** zirconium tetrakisacetylacetonate catalyst
- IT Lactones  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(ring-opening **polymerization** of; process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)
- IT Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(hydroxycarboxylic acid-based, homo- and co-, aliphatic; process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)
- IT **Polymerization**  
(ring-opening, of **cyclic esters**; process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)
- IT 999-97-3, Hexamethyldisilazane  
RL: MOA (Modifier or additive use); **USES (Uses)**  
(for removal of OH-containing impurities from lactone monomers; process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)
- IT 14475-63-9D, Zirconic acid, tetraalkyl esters 18717-38-9,  
Diacetylacetonatozirconium dichloride 80042-49-5  
RL: CAT (Catalyst use); **USES (Uses)**  
(process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)
- IT 24980-41-4P,  $\epsilon$ -Caprolactone polymer 25248-42-4P,  
 $\epsilon$ -Caprolactone polymer, SRU 26023-30-3P 26161-42-2P  
**26680-10-4P**, Poly-D,L-lactide **26780-50-7P**,  
Glycolide-DL-lactide copolymer 31852-84-3P, Trimethylene carbonate polymer **33135-50-1P**, Poly-L-lactide 50862-75-4P, Trimethylene carbonate polymer, SRU  
RL: **IMF (Industrial manufacture); PREP (Preparation)**  
(process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)
- IT 17501-44-9, Zirconium tetrakis(acetylacetonate)  
RL: CAT (Catalyst use); **USES (Uses)**  
(ring-opening **polymerization** catalyst; process for the preparation of tin-free homo- or copolyesters of aliphatic hydroxycarboxylic acids)

L32 ANSWER 56 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1995:511495 CAPLUS

DOCUMENT NUMBER: 122:240787

TITLE: Preparation of polyester of controlled molecular weight based on the determination of free acid impurities in monomer

INVENTOR(S): Shinoda, Hosei; Ohtaguro, Masami; Funae, Akihiro; Iimuro, Shigeru

PATENT ASSIGNEE(S): Mitsui Toatsu Chemicals, Inc., Japan

SOURCE: Eur. Pat. Appl., 18 pp.

CODEN: EPXXDW

DOCUMENT TYPE: Patent  
 LANGUAGE: English  
 FAMILY ACC. NUM. COUNT: 1  
 PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
EP 624613	A2	19941117	EP 1994-106977	19940504
EP 624613	A3	19950215		
EP 624613	B1	20001025		
R: CH, DE, FR, GB, IT, LI, NL				
JP 07233246	A2	19950905	JP 1994-84651	19940422
JP 3075665	B2	20000814		
US 5412067	A	19950502	US 1994-235534	19940429
PRIORITY APPLN. INFO.:			JP 1993-108412	A 19930510
			JP 1993-332006	A 19931227

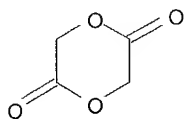
AB. In ring-opening **polymerization** of a **cyclic ester** compound (A) in the presence of a hydroxyl compound as a mol. weight regulator in the reaction system, the mol. weight of polyester can be accurately controlled by previously estimating the amount of free carboxylic acid contained in the **cyclic ester** compound by measuring the difference in elec. conductivity ( $\Delta EC0$ ) of A in hydrophilic organic solvent/water mixture relative to the elec. conductivity of the solvent solution itself. The relationship between the amount of free acid in A and the amount of mol. weight regulator to be added is described by the empirical formula  $A + f + L = B$ , A, B = consts.; f = amount of free acid from measurements above; L = amount of mol. weight regulator. Polyglycolic acid of weight average mol. weight 172,000 was prepared by calculating f 8.98 mequiv/kg (by measuring  $\Delta EC0$  to be 0.50  $\mu S/cm$ ) and using 0.339% lauryl alc. (based on glycolide feed) as the needed mol. weight regulator.

IT **26202-08-4P**, Glycolide homopolymer **33135-50-1P**, L-Lactide homopolymer **41706-81-4P**,  $\epsilon$ -Caprolactone-glycolide copolymer **142227-56-3P**, Glycolide-lactic acid copolymer  
 RL: **IMF (Industrial manufacture); PREP (Preparation)**  
 (preparation of polyester of controlled mol. weight based on the determination of free acid impurities in monomer)

RN 26202-08-4 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6  
 CMF C4 H4 O4



RN 33135-50-1 CAPLUS

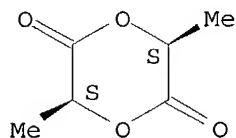
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



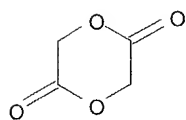
RN 41706-81-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, polymer with 2-oxepanone (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

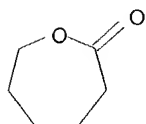
CMF C4 H4 O4



CM 2

CRN 502-44-3

CMF C6 H10 O2



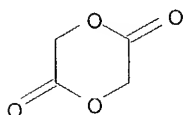
RN 142227-56-3 CAPLUS

CN Propanoic acid, 2-hydroxy-, polymer with 1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

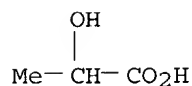
CMF C4 H4 O4



CM 2

CRN 50-21-5

CMF C3 H6 O3



IC ICM C08G063-08

CC 35-8 (Chemistry of Synthetic High Polymers)

ST polyglycolic acid controlled mol wt; lauryl alc regulator polyester manuf;  
elec cond free acid impurity

IT Electric conductivity and conduction  
(for determination of free acid in **cyclic ester** feed  
conversion to polyester of controlled mol. weight)

IT Polyesters, preparation  
RL: IMF (Industrial manufacture); **PREP (Preparation)**  
(preparation of polyester of controlled mol. weight based on the  
determination of free  
acid impurities in monomer)

IT **Polymerization**  
(ring-opening, preparation of polyester of controlled mol. weight based on  
the  
determination of free acid impurities in monomer)

IT 95-96-5, DL-Lactide 112-53-8, Lauryl alcohol  
RL: RCT (Reactant); RACT (Reactant or reagent)  
(mol. weight regulator; preparation of polyester of controlled mol. weight  
based  
on the determination of free acid impurities in monomer)

IT 26009-03-0P, Polyglycolic acid 26023-30-3P, Poly[oxy(1-methyl-2-oxo-1,2-  
ethanediyl)] 26202-08-4P, Glycolide homopolymer

33135-50-1P, L-Lactide homopolymer 41706-81-4P,  
ε-Caprolactone-glycolide copolymer 142227-56-3P,  
Glycolide-lactic acid copolymer

RL: IMF (Industrial manufacture); PREP (Preparation)

(preparation of polyester of controlled mol. weight based on the  
determination of free  
acid impurities in monomer)

L32 ANSWER 57 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1993:450029 CAPLUS

DOCUMENT NUMBER: 119:50029

TITLE: Biodegradable polymers. 7th Comm. On the mechanism of  
ring-opening polymerization of  
cyclic esters of aliphatic  
hydroxycarboxylic acids by means of different tin  
compounds

AUTHOR(S): Dahlmann, J.; Rafler, G.

CORPORATE SOURCE: Forschungsstandort Teltow-Seehof, Projekt.  
Nachwachsende Rohstoffe, Teltow, O-1530, Germany

SOURCE: Acta Polymerica (1993), 44(2), 103-7

CODEN: ACPODY; ISSN: 0323-7648

DOCUMENT TYPE: Journal

LANGUAGE: English

AB To elucidate the effect of tin compds. in the ring-opening polymn  
. of lactides and lactones, D,L-dilactide was taken as an example, and its  
reaction with different tin compds. at a molar ratio of 1:1 as well as the  
polymer formation and degradation in dependence of its concentration has been  
investigated. Two entirely different reaction courses were observed which  
are consequently influenced by compds. with alc. and/or carboxylic OH  
groups in different ways.

IT 26680-10-4P 26780-50-7P

RL: SPN (Synthetic preparation); PREP (Preparation)

(preparation of, organotin catalysts for)

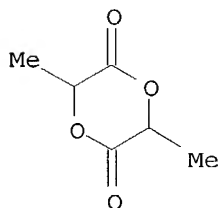
RN 26680-10-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4



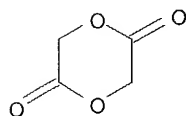
RN 26780-50-7 CAPLUS

CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione  
(9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

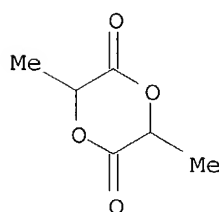
CMF C4 H4 O4



CM 2

CRN 95-96-5

CMF C6 H8 O4



CC 35-7 (Chemistry of Synthetic High Polymers)

ST biodegradable lactide lactone polymer synthesis; organotin catalyst  
biodegradable polymer synthesis; ring opening **polymn** organotin  
catalyst; dilactide **polymn** tin dioctoate catalyst; diglycolide  
**polymn** tetraphenyltin dibutyldimethoxytin catalyst; caprolactone  
**polymn** dimethylaminotrimethyl stannan catalyst

IT Biodegradable materials

(lactide and lactone (co)polymers, preparation of, organotin catalysts for)

IT **Polymerization** catalysts

(ring-opening, organotin compds., for lactides and lactones)

IT 301-10-0, Tin dioctoate 595-90-4, Tetraphenyltin 818-08-6, Dibutyltin  
oxide 993-50-0 1067-21-6 1067-55-6, Dibutyldimethoxytin 2291-82-9

RL: CAT (Catalyst use); USES (Uses)

(catalysts, for ring-opening **polymerization** of lactides and  
lactones)

IT 24980-41-4P, ε-Caprolactone homopolymer 26023-30-3P

26680-10-4P 26780-50-7P

RL: **SPN** (Synthetic preparation); **PREP** (Preparation)

(preparation of, organotin catalysts for)

IT 65-85-0, Benzoic acid, uses 97-64-3, Ethyl lactate 100-51-6, Benzyl  
alcohol, uses 108-93-0, Cyclohexanol, uses

RL: USES (Uses)  
(ring-opening **polymerization** of dilactide by tetraphenyltin in  
presence of)

L32 ANSWER 58 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN  
ACCESSION NUMBER: 1993:409301 CAPLUS  
DOCUMENT NUMBER: 119:9301  
TITLE: Poly(L-lactide) crosslinked with spiro-bis-  
dimethylenecarbonate  
AUTHOR(S): Grijpma, D. W.; Kroeze, E.; Nijenhuis, A. J.;  
Pennings, A. J.  
CORPORATE SOURCE: Dep. Polym. Chem., Univ. Groningen, Groningen, 9747  
AG, Neth.  
SOURCE: Polymer (1993), 34(7), 1496-503  
CODEN: POLMAG; ISSN: 0032-3861  
DOCUMENT TYPE: Journal  
LANGUAGE: English

AB Poly(L-lactide) (I) and other poly(lactones) can be crosslinked by  
ring-opening **polymerization** of the corresponding **cyclic**  
**esters** in the presence of a tetrafunctional bicyclic biscarbonate.  
Spiro-bis-dimethylenecarbonate (II) was synthesized from pentaerythritol  
and diethylene-carbonate and used to prepare polyester networks for use in  
biomedical applications. Bulk copolymn. of L-lactide with only small  
amts. of this crosslinker leads to networks with very high gel percentages  
of  $\leq 100\%$ . The initial crystallinity of these crosslinked I, as  
well as the melting temperature, is very much reduced when compared with the  
corresponding homopolymer. The degradation of the polymer in vivo is  
therefore expected to be enhanced and more benign at longer durations.  
Tensile strength and impact resistance are also greatly influenced by  
copolymn. with II. Much tougher and stronger materials can be obtained in  
this way. These favorable properties allow the material to be used in the  
preparation of degradable implants such as fracture fixation devices.

IT 147965-66-0P

RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation and characterization of crosslinked)

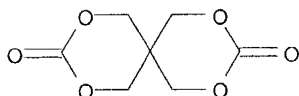
RN 147965-66-0 CAPLUS

CN 2,4,8,10-Tetraoxaspiro[5.5]undecane-3,9-dione, polymer with  
(3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 84056-48-4

CMF C7 H8 O6

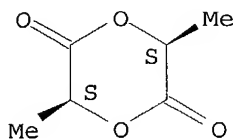


CM 2



CRN 4511-42-6  
CMF C6 H8 O4

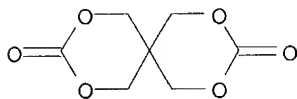
Absolute stereochemistry.



IT 147965-67-1P 147965-69-3P  
RL: SPN (Synthetic preparation); PREP (Preparation)  
(preparation of crosslinked)  
RN 147965-67-1 CAPLUS  
CN 2,4,8,10-Tetraoxaspiro[5.5]undecane-3,9-dione, polymer with  
3,6-dimethyl-1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

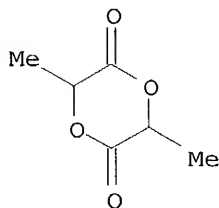
CM 1

CRN 84056-48-4  
CMF C7 H8 O6



CM 2

CRN 95-96-5  
CMF C6 H8 O4



RN 147965-69-3 CAPLUS  
CN 2,4,8,10-Tetraoxaspiro[5.5]undecane-3,9-dione, polymer with  
(3S-cis)-3,6-dimethyl-1,4-dioxane-2,5-dione and 1,3-dioxan-2-one (9CI)  
(CA INDEX NAME)

CM 1

CRN 84056-48-4

CMF C7 H8 O6

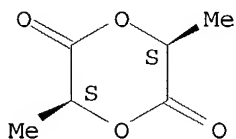


CM 2

CRN 4511-42-6

CMF C6 H8 O4

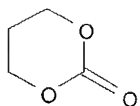
Absolute stereochemistry.



CM 3

CRN 2453-03-4

CMF C4 H6 O3



CC 35-8 (Chemistry of Synthetic High Polymers)

Section cross-reference(s): 37, 63

ST polylactide crosslinking spirobisdimethylene carbonate; polylactone crosslinking spirobisdimethylene carbonate; **polymn** lactone spirobisdimethylene carbonate crosslinking

IT Heat of fusion and Heat of freezing

Polymer interaction parameter

(of poly(lactide) crosslinked with spirobisdimethylenecarbonate)

IT Crosslinking

(of polylactones, with spirobisdimethylenecarbonate)

IT Crosslinking agents

(spirobisdimethylenecarbonate, for lactones, network properties in relation to)

IT Polyesters, preparation  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (lactone-based, preparation and characterization of, crosslinked with  
 spirobisdimethylenecarbonate)

IT Polymerization  
 (ring-opening, of lactones, with spirobisdimethylenecarbonate,  
 crosslinking in)

IT Virial coefficient  
 (second, of poly(lactide) crosslinked with  
 spirobisdimethylenecarbonate)

IT 147965-66-0P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and characterization of crosslinked)

IT 84056-48-4P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation and copolymn. of, with lactones)

IT 147965-67-1P 147965-68-2P 147965-69-3P  
 RL: SPN (Synthetic preparation); PREP (Preparation)  
 (preparation of crosslinked)

IT 115-77-5, reactions  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with diethylene carbonate)

IT 105-58-8  
 RL: RCT (Reactant); RACT (Reactant or reagent)  
 (reaction of, with pentaerythritol)

L32 ANSWER 59 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1992:256308 CAPLUS

DOCUMENT NUMBER: 116:256308

TITLE: Process and catalyst for the polymerization  
 of cyclic esters

INVENTOR(S): Nijenhuis, Atze Jan; Pennings, Albertus Johannes

PATENT ASSIGNEE(S): Stamicarbon B. V., Neth.

SOURCE: PCT Int. Appl., 22 pp.

CODEN: PIXXD2

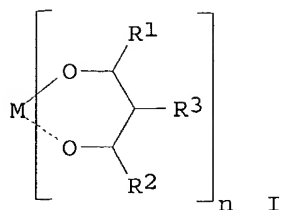
DOCUMENT TYPE: Patent

LANGUAGE: English

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	----	-----	-----	-----
WO 9116368	A1	19911031	WO 1991-NL63	19910419
W: CA, FI, JP, NO, US				
RW: AT, BE, CH, DE, DK, ES, FR, GB, GR, IT, LU, NL, SE				
NL 9000959	A	19911118	NL 1990-959	19900421
PRIORITY APPLN. INFO.:			NL 1990-959	19900421
OTHER SOURCE(S):		MARPAT 116:256308		
GI				



AB **Cyclic ester** polymers, useful in biomedical applications, are prepared by ring-opening **polymerization** in presence of chelate catalyst I (M = metal ion; n = 1-4 integer; R1, R2 = alkyl, aryl, cycloaliph.; R3 = alkyl, aryl, cycloaliph., H; and R1-R3 are such that the m.p. is less than the **polymerization** temperature). The monomer/catalyst molar ratio (R) is 1000-300,000. Thus, L-lactide and Zn bis(2,2-dimethyl-3,5-heptanedionate) in 11,250:1 molar ratio was evacuated to 10-3 mbar, sealed heated to 110° for 84 h for 99% conversion to polymer with m.p. 202°, melting heat 99 J g<sup>-1</sup>, and viscosity-average mol. weight 800,000.

IT **9051-87-0P 26202-08-4P**, Glycolide polymer

**30846-39-0P**, Glycolide-L-lactide copolymer **41706-81-4P**,

ε-Caprolactone-glycolide copolymer **65408-67-5P**

RL: **PREP (Preparation)**

(preparation of, ring-opening catalysts for, chelate compds. as)

RN 9051-87-0 CAPLUS

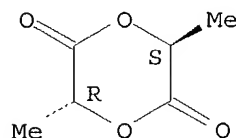
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
rel-(3R,6S)-3,6-dimethyl-1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 13076-19-2

CMF C6 H8 O4

Relative stereochemistry.

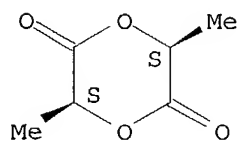


CM 2

CRN 4511-42-6

CMF C6 H8 O4

Absolute stereochemistry.



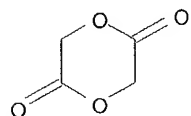
RN 26202-08-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

CMF C4 H4 O4



RN 30846-39-0 CAPLUS

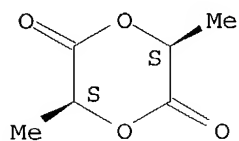
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with  
1,4-dioxane-2,5-dione (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

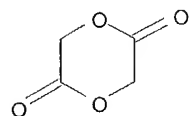
Absolute stereochemistry.



CM 2

CRN 502-97-6

CMF C4 H4 O4



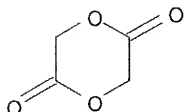
RN 41706-81-4 CAPLUS

CN 1,4-Dioxane-2,5-dione, polymer with 2-oxepanone (9CI) (CA INDEX NAME)

CM 1

CRN 502-97-6

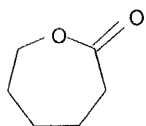
CMF C4 H4 O4



CM 2

CRN 502-44-3

CMF C6 H10 O2



RN 65408-67-5 CAPLUS

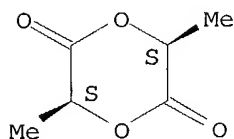
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, polymer with 2-oxepanone (9CI) (CA INDEX NAME)

CM 1

CRN 4511-42-6

CMF C6 H8 O4

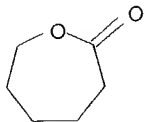
Absolute stereochemistry.



CM 2

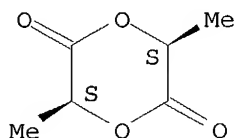
CRN 502-44-3

CMF C6 H10 O2



IT 33135-50-1P, L-Lactide polymer  
 RL: PREP (Preparation)  
 (preparation of, ring-opening, chelate catalyst for)  
 RN 33135-50-1 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, (3S,6S)-, homopolymer (9CI) (CA INDEX NAME)  
 CM 1  
 CRN 4511-42-6  
 CMF C6 H8 O4

Absolute stereochemistry.



IC ICM C08G063-83  
 ICS C08G063-85; C08G063-08; C08G064-30  
 CC 35-7 (Chemistry of Synthetic High Polymers)  
 ST **cyclic ester** polymer chelate catalyst; zinc dimethylheptanedionate **polymn** catalyst lactide; ring opening **polymn cyclic ester**  
 IT Polyesters, preparation  
 RL: PREP (Preparation)  
 (preparation of, ring-opening of **cyclic esters** in, chelate catalysts for)  
 IT **Polymerization** catalysts  
 (ring-opening, chelate compds., for **cyclic esters**)  
 IT 16009-86-2 135776-92-0  
 RL: CAT (Catalyst use); USES (Uses)  
 (catalyst, for ring-opening **polymerization** of **cyclic esters**)  
 IT 9051-87-0P 26202-08-4P, Glycolide polymer  
 30846-39-0P, Glycolide-L-lactide copolymer 31852-84-3P, Trimethylene carbonate polymer 41706-81-4P, ε-Caprolactone-glycolide copolymer 65408-67-5P  
 RL: PREP (Preparation)  
 (preparation of, ring-opening catalysts for, chelate compds. as)  
 IT 33135-50-1P, L-Lactide polymer

RL: **PREP (Preparation)**

(preparation of, ring-opening, chelate catalyst for)

L32 ANSWER 60 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1991:450571 CAPLUS

DOCUMENT NUMBER: 115:50571

TITLE: Manufacture of biologically degradable (co)polyesters having controlled molecular weights

INVENTOR(S): Dahlmann, Juergen; Fechner, Klaus; Junghanss, Baerbel; Rafler, Gerald; Rahn, Hans Werner; Ruhnau, Ingrid; Schaubelt, Kristin; Ulrich, Hans Heinz

PATENT ASSIGNEE(S): Akademie der Wissenschaften der DDR, Ger. Dem. Rep.

SOURCE: Ger. (East), 4 pp.

CODEN: GEXXA8

DOCUMENT TYPE: Patent

LANGUAGE: German

FAMILY ACC. NUM. COUNT: 1

PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
-----	---	-----	-----	-----
DD 285363	A5	19901212	DD 1989-330037	19890628
PRIORITY APPLN. INFO.:			DD 1989-330037	19890628
AB Biodegradable (co)polyesters, based on dilactides and diglycolides and having number-average mol. weight of 5000-20,000, are prepared by the ring-opening polymerization of cyclic esters in the presence of Sn <sup>2+</sup> initiators by conducting the polymerization in the presence of 10-5-10-3 aliphatic polyhydric alcs. as chain-transfer agents. These polyesters have applications as carriers for sustained-release pharmaceutical systems and biodegradable sutures (no data). Thus 18 g D,L-3,6-dimethyl-1,4-dioxan-2,5-dione was homopolymd. in the presence of 10 mg Sn(II) octanoate and 2.6 mol glycerin/mol monomer, producing a polyester having number-average mol. weight 10.3 x 10 <sup>3</sup> and CO <sub>2</sub> H content 74 µequiv/g, vs 21.2 x 10 <sup>3</sup> and 51, resp., for a control polymerization conducted in the absence of glycerin.				

IT 26680-10-4P, D,L-3,6-Dimethyl-1,4-dioxane-2,5-dione homopolymer  
26780-50-7P, 1,4-Dioxane-2,5-dione-1-D,L-3,6-dimethyl-1,4-dioxane-2,5-dione copolymer

RL: **IMF (Industrial manufacture); PREP (Preparation)**

(manufacture of, biodegradable, having controlled mol. weight, chain-transfer agents for)

RN 26680-10-4 CAPLUS

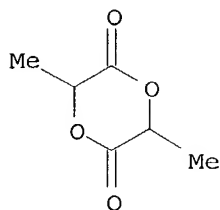
CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, homopolymer (9CI) (CA INDEX NAME)

CM 1

CRN 95-96-5

CMF C6 H8 O4

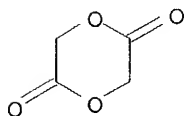




RN 26780-50-7 CAPLUS  
 CN 1,4-Dioxane-2,5-dione, 3,6-dimethyl-, polymer with 1,4-dioxane-2,5-dione  
 (9CI) (CA INDEX NAME)

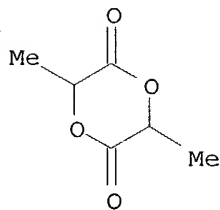
CM 1

CRN 502-97-6  
 CMF C4 H4 O4



CM 2

CRN 95-96-5  
 CMF C6 H8 O4



IC ICM C08G063-08  
 ICS C08K005-05; A61L017-00; A61K047-00  
 CC 35-7 (Chemistry of Synthetic High Polymers)  
 Section cross-reference(s): 63  
 ST controlled mol wt biodegradable polyester; suture manuf biodegradable  
 polyester; glycerol chain regulator polyester manuf; dimethyldioxanedione  
 homopolymn glycerol chain transfer agent; sustained release pharmaceutical  
 polyester substrate  
 IT Polyesters, preparation  
 RL: IMF (Industrial manufacture); **PREP (Preparation)**  
 (manufacture of, biodegradable, by ring-opening polymerization,

chain-transfer agents for)

IT Chain-transfer agents  
(polyhydric alcs., in manufacture of biodegradable (co)polyesters with controlled mol. weight)

IT Alcohols, uses and miscellaneous  
RL: USES (Uses)  
(polyhydric, chain-transfer agents, for manufacture of biodegradable (co)polyesters with controlled mol. weight)

IT **Polymerization**  
(ring-opening, manufacture of biodegradable polyesters by, chain-transfer agents for)

IT 56-81-5, Glycerin, uses and miscellaneous  
RL: USES (Uses)  
(chain-transfer agents, in manufacture of biodegradable (co)polyesters with controlled mol. weight)

IT 26023-30-3P, D,L-3,6-Dimethyl-1,4-dioxane-2,5-dione homopolymer, SRU  
26680-10-4P, D,L-3,6-Dimethyl-1,4-dioxane-2,5-dione homopolymer  
26780-50-7P, 1,4-Dioxane-2,5-dione-1-D,L-3,6-dimethyl-1,4-dioxane-2,5-dione copolymer  
RL: IMF (Industrial manufacture); PREP (Preparation)  
(manufacture of, biodegradable, having controlled mol. weight,  
chain-transfer  
agents for)

L32 ANSWER 61 OF 61 CAPLUS COPYRIGHT 2004 ACS on STN

ACCESSION NUMBER: 1970:101382 CAPLUS  
DOCUMENT NUMBER: 72:101382  
TITLE: Polyimides prepared from carbamic acids  
PATENT ASSIGNEE(S): Farbenfabriken Bayer A.-G.  
SOURCE: Fr., 11 pp.  
CODEN: FRXXAK  
DOCUMENT TYPE: Patent  
LANGUAGE: French  
FAMILY ACC. NUM. COUNT: 1  
PATENT INFORMATION:

PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
FR 1576844		19690801		
DE 1720695			DE	
GB 1240291			GB	
US 3560446		19710000	US	
PRIORITY APPLN. INFO.:			DE	19671107
			DE	19671204

AB Heat-stable polyimides, useful for preparing molded articles and varnishes for metal wires, are prepared by treating a polyfunctional carbamate ester with a cyclic polycarboxylic acid anhydride. For example, a mixture of 125 g (4-OCNC6H4)2CH2 and 31 g HOCH2CH2OH in 300 ml PhMe was heated 1 hr at 100°, cooled to 30°, a mixture of trimellitic acid anhydride 96, glycerol 18, PbO 0.1, Zn octanoate 0.2, and cresol 700 g added, heated 3 hr at 200°, converted to films, and the films cured at 200-90° to give elastic and transparent

polyimide products.

IT 26427-90-7P

RL: PREP (Preparation)

(manufacture of, ring closure in)

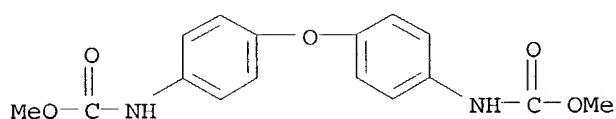
RN 26427-90-7 CAPLUS

CN 1,2,4,5-Benzenetetracarboxylic 1,2:4,5-dianhydride, polymer with dimethyl 4,4'-oxydicarbanilate (8CI) (CA INDEX NAME)

CM 1

CRN 37037-29-9

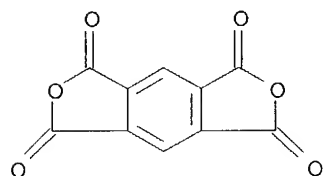
CMF C16 H16 N2 O5



CM 2

CRN 89-32-7

CMF C10 H2 O6



IC C08G

CC 36 (Plastics Manufacture and Processing)

ST polyimides; carbamates polyimides

IT Ring closure

(in **polymerization**, of carbamic acid esters with polycarboxylic acid anhydrides)

IT **Polymerization**

(ring closure and, of carbamic acid esters with polycarboxylic acid anhydrides)

IT Imide, poly-

RL: PROC (Process)

(manufacture of, from carbamic acid esters and polycarboxylic acid anhydrides)

IT 1,2,4-Benzenetricarboxylic acid, **cyclic** 1,2-anhydride,

**ester** with glycolic acid, polymer with dibutyl

(4-methyl-m-phenylene)dicarbamate

Carbamic acid, (4-methyl-m-phenylene)di-, dibutyl ester, polymer with

1,2,4-benzenetricarboxylic acid **cyclic** 1,2-anhydride,  
**ester** with glycolic acid

Glycolic acid, ester with 1,2,4-benzenetricarboxylic acid **cyclic**  
1,2-anhydride, polymer with dibutyl (4-methyl-m-phenylene)dicarbamate

Toluene-2,4-dicarbamic acid, dibutyl ester, polymer with  
1,2,4-benzenetricarboxylic acid **cyclic** 1,2-anhydride,  
**ester** with glycolic acid

RL: PROC (Process)

(manufacture of, ring closure in)

IT 26427-89-4P 26427-90-7P 26428-71-7P

RL: PREP (Preparation)

(manufacture of, ring closure in)

=>